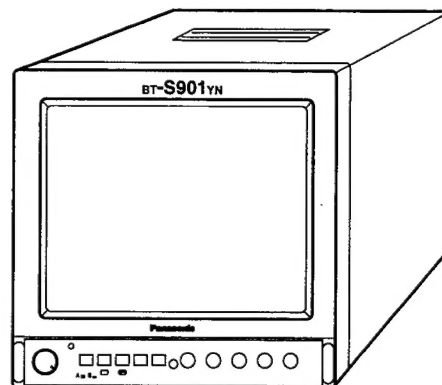


Service Manual

Simplified

Color Video Monitor
BT-S901YN

Chassis No. KMX-F903D



The service technician is required to read and follow the "Safety Precautions" and "Important Safety Notice" in this service manual.

Please file and use this simplified manual together with the service manual for Model No. BT-S901Y, Order No. KME9009164C1.

Specifications

Power Source

120 V AC, 50/60 Hz

Power Consumption

37 W

Maximum Ampere

0.75 A

Picture Tube

9 inches measured diagonally, 90-degree deflection

Speaker

2¹/₂ inches round type, located on cabinet left

Speaker output

1.0 W(at 10 % distortion), 1.2 W(MAX) Impedance 16Ω

Television System

NTSC-M System (American TV Standard 525 line/60 field)

Operating Temperature

32 ~ 104 °F (0 ~ 40 °C)

Operating Humidity

20 ~ 80 % (non-condensing)

Connection Terminals (Input/Output)

Line A

S-Video IN/OUT : Y 1.0 Vp-p, C 0.3 Vp-p, High or 75Ω switchable, 4P Mini DIN type
Video IN/OUT : 1.0 Vp-p ± 10 %, High or 75Ω automatic, BNC type
Audio IN/OUT : 0.5 Vrms ± 10 %, 10kΩ (min.) RCA phono type

Line B

Video IN/OUT : 1.0 Vp-p ± 10 %, High or 75Ω automatic, BNC type
Audio IN/OUT : 0.5 Vrms ± 10 %, 10kΩ (min.) RCA phono type

External Sync IN/OUT

: 2.0 ~ 4.0 Vp-p (negative) High or 75Ω automatic, BNC type

Dimensions

Width: 8²⁵/₃₂ inches (223 mm)
Height: 9 inches (228.5 mm)
Depth: 12¹¹/₁₆ inches (321.5 mm)

Weight

15.5 lbs (7.0 kg)

Design and specifications are subject to change without notice.

Weight and dimensions shown are approximate.

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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PRODUCT COMPLIES WITH DHHS RULES 21 CFR SUBCHAPTER J IN EFFECT AS OF DATE OF MANUFACTURE.

IMPORTANT SAFETY NOTICE

There are special components used in Panasonic Monitor sets which are important for safety. These parts are shaded on the schematic diagram. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent X-Radiation, shock, fire, or other hazards. Do not modify the original design without permission of PANASONIC BROADCAST & TELEVISION SYSTEMS COMPANY.

WARNING: This equipment has been tested and found to comply with the limits for a class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

CAUTION: Any unauthorized changes or modifications to this equipment would void the users authority to operate.

SAFETY PRECAUTIONS

General Guidelines

1. It is advisable to insert an isolation transformer in the AC power line before servicing a hot chassis.
2. When servicing, observe the original lead dress, especially the lead dress in the high voltage circuits. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
3. After servicing, see to it that all the protective devices such as insulation barriers, insulation papers, shields, and isolation R-C combinations, are properly installed.
4. Before switching the power on, measure the resistance between B+ line and cold side chassis ground. Connect the "-" side of an ohmmeter to the B+ line, and the "+" side to chassis ground. Each line must have more resistance value than the specified one as follows:

B+ Line	Minimum Resistance
121V	140 Ω
27V	150 Ω
15V	150 Ω
12V	140 Ω

5. When the set is not used for a long period of time, unplug the AC power cord plug from the AC line outlet.
6. Potentials, as high as $22.0 \pm 1\text{kV}$, are present when the set is in operation. Operating the set without the rear cover involves in a dangerous electrical shock from the set power supply. Servicing must not be attempted by anyone who is not thoroughly familiar with the necessary precautions when working on high voltage equipment. Always discharge the anode of the picture tube to chassis ground before handling the picture tube.
7. After servicing, make the following leakage current checks to prevent the customer from getting a dangerous electrical shock.

Leakage Current Cold Check

1. Unplug the AC power cord and short between the two prongs of the AC plug with a jumper wire.
2. Set the power switch of this set to ON position.
3. Measure the resistance value with an ohmmeter between the shorted AC plug and each exposed metallic part of the set cabinet such as screwheads, connectors, and control shafts. When the exposed metallic part has a return path to the chassis, the reading should be between $240\text{k}\Omega$ and $5.2\text{M}\Omega$. When the exposed metal part does not have a return path to the chassis, the reading must be infinity.

Leakage Current Hot Check (See Fig. 1)

1. Plug the AC power cord directly into the AC line outlet. Do not use an isolation transformer for this check.
2. Connect a $1.5\text{k}\Omega$ 10 watt resistor in parallel with a $0.15\mu\text{F}$ capacitor between each exposed metallic part of the set and an earth ground such as a water pipe.
3. Use an AC voltage meter with $1\text{k}\Omega/\text{volt}$ or more sensitivity to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.
5. The potential at any point should not exceed 0.75Vrms . A leakage current tester (Simpson Model 229 or the equivalent) may be used to make the hot checks. Leakage current must not exceed $500\mu\text{A}$. If a measurement is outside of the specified limits, there is a possibility of a shock hazard, and the monitor should be repaired and rechecked before it is returned to the customer.

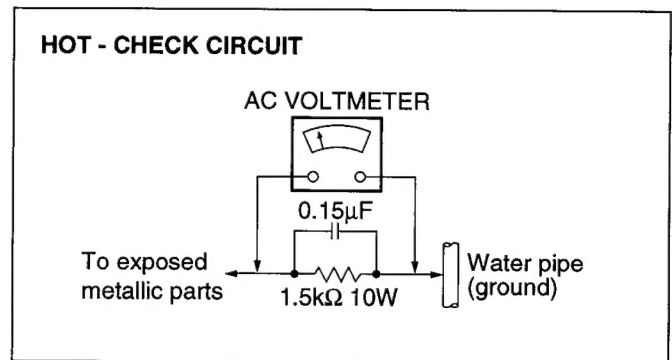


Fig. 1

X-Radiation

WARNING:

1. The potential sources of X-Radiation in the monitor set are the high voltage section and picture tube.
2. When using a picture tube test jig for service, make sure that the jig is capable of handling 22.0kV without causing X-Radiation.

Note : It is important to use an accurate, periodically calibrated high voltage meter.

1. Turn Bright and Contrast controls fully counterclockwise.
2. Set SERVICE switch to SERVICE position.
3. Measure the high voltage. The high voltage meter (electrostatic type) reading should indicate $22.0\text{kV} \pm 1.0\text{kV}$. If the meter indication is out of tolerance, immediate service and correction is required to prevent the possibility of premature component failure.
4. To prevent an X-radiation possibility, it is essential to use the specified picture tube.

HORIZONTAL OSC. DISABLE CIRCUIT TEST

SERVICE WARNING: This test must be made as a final check before the monitor is returned to the customer after repairs are made.

1. With rear cover removed, supply nominal 120 V AC to the monitor and turn on power switch.
2. Received a monoscope pattern signal and adjust user controls to normal position.
3. Turn off the power switch.
4. Connect 5k Ω control VR with its resistance maximum between TP92 and TP93.
5. Turn on the power switch again.
6. Turn the 5k Ω control VR slowly to decrease its resistance.
7. Confirm that the picture falls out of horizontal sync.
8. If the test fails, Horizontal Osc. Disable Circuit is not operating and must be repaired.
Refer to the Horizontal Osc. Disable Circuit Repair Procedure.

HORIZONTAL OSC. DISABLE CIRCUIT REPAIR PROCEDURE

- 1) Connect a DC voltmeter between the cathode of D510 and chassis ground of the main circuit board. If approximately 21V is not present on the cathode of D510, find the cause. Check R529, D510 and C525.
- 2) Connect a DC voltmeter between the cathode of D512 and chassis ground of the main circuit board. If approximately 12V is not present on the cathode of D512, find the cause. Check R524, R523 and D511.
- 3) Repeat step 2) procedure. If approximately 12V is not present on the cathode, Check D512, R522, Q504, R521 and IC401.
- 4) Carefully check above specified parts, and related circuits and parts. When the circuit is repaired, try the Horizontal Osc. Disable Circuit Test again.

HORIZONTAL OSC. DISABLE CIRCUIT EXPLANATION

1. Under normal operating conditions, zener diode D512 is CUT OFF since its breakdown voltage is not reached.
2. When the amplitude of the pulse applied to diode D510 increase, the cathode voltage of zener diode D512 rises, and D512 conducts.
3. The conduction of D512 increase the base voltage of Q504 and causes it to conduct.
4. This causes the pin ③ voltage of IC401 to decrease. As a result the horizontal oscillator frequency goes higher and the picture on the screen falls out of horizontal sync.

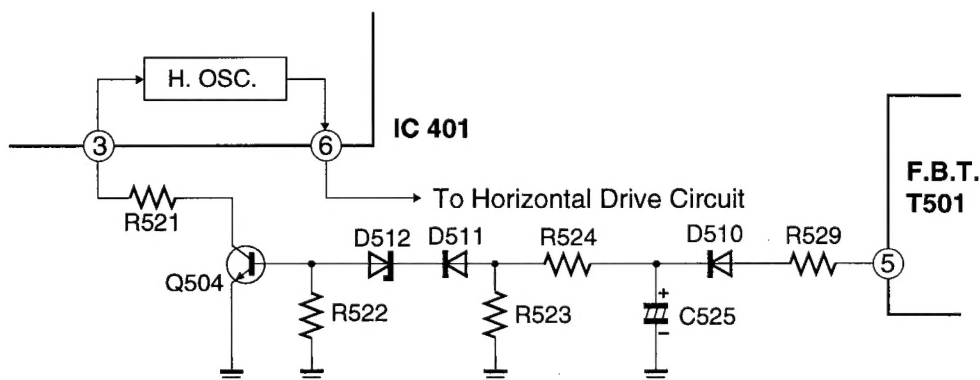


Fig. 2

ADJUSTMENTS

UNDERSCAN V.SIZE ADJUSTMENT

1. Apply a monoscope pattern to the monitor.
2. Push UNDERSCAN switch on the front panel.
3. Adjust U.S V-SIZE control (R411) until picture height becomes $6\text{ mm} \pm 1\text{ mm}$ shorter than picture tube screen at top and bottom as shown in figure 3.
4. If the picture is shifted upper or lower, adjust V-POSITION control (R418).

UNDERSCAN H.SIZE ADJUSTMENT

1. Apply a monoscope pattern to the monitor.
2. Push UNDERSCAN switch on the front panel.
3. Adjust U.S H-SIZE control (R566) until picture width becomes $4\text{ mm} \pm 1\text{ mm}$ shorter than picture tube screen at both sides as shown in figure 3.
4. If the picture is shifted left or right, adjust H-CENTER control (R520).

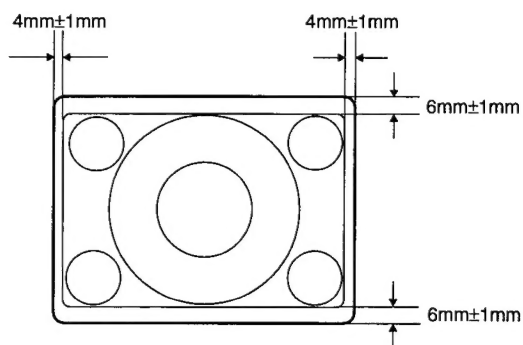


Figure 3

ALIGNMENTS

SUB-CONTRAST ALIGNMENT

1. Apply a studio color bar signal. Input signal should be 1.0 Vp-p. (video level 0.7 Vp-p, sync level 0.3 Vp-p).
2. Set BRIGHT (R350) and CONTRAST (R344) controls to center position(click point).
3. Set COLOR control (R613) fully counterclockwise.
4. Connect an oscilloscope to TP48 on C-board.
5. Adjust SUB-CONTRAST control (R327) to obtain 0.9 Vp-p from white level to black level.(See figure 4)

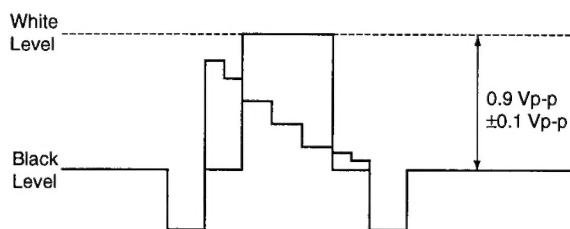


Figure 4

Replacement parts list

IMPORTANT SAFETY NOTICE

Components identified by the International symbol Δ have special characteristics important for safety.
When replacing any of these components, use only the manufacturer's specified parts.

Abbreviation of part name and description

1. Resistor

Example:

ERD25TJ104 C 100KOHM, J, 1/4W

TYPE	ALLOWANCE
TYPE	ALLOWANCE
C : Carbon	F : $\pm 1\%$
F : Fuse	G : $\pm 2\%$
M : Metal Oxide	J : $\pm 5\%$
Metal Film	K : $\pm 10\%$
S : Solid	M : $\pm 20\%$
W : Wire Wound	

2. Capacitor

Example:

ECKF1H103ZF C 0.01PF, Z, 50V

TYPE	ALLOWANCE
TYPE	ALLOWANCE
C : Ceramic	C : $\pm 0.25\text{ pF}$
E : Electrolytic	D : $\pm 0.5\text{ pF}$
P : Polyester	F : $\pm 1\text{ pF}$
PP: Polypropylene	J : $\pm 5\%$
T : Tantalum	K : $\pm 10\%$
	L : $\pm 15\%$
	M : $\pm 20\%$
	P : $+100\%, -0\%$
	Z : $+80\%, -20\%$

Note: For G \bigcirc \bigcirc of Ref. No., not indicate illustration of it part on "MECHANICAL PARTS LOCATION" of BT-S901Y Service Manual.

Printed circuit board assembly with mark (RTL) is no longer available after production discontinuation of the complete set.

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
MECHANICAL PARTS			B1	XTB4+15AFZ	SCREW
Δ M1	A22JWG098X	PICTURE TUBE	B2	XTW3+6LFZ	TAPPING SCREW
M2	TAST66C-8615	SPEAKER	B5	THE415-2	SCREW
Δ M3	TXALY85375FA	DEFLECTION YOKE	B6	XTV3+12G	SCREW
Δ M4	EVVGU5F25B14	CONTROL 10KOHMB	B7	THW40807-9	WASHER
M5	TXFKA99MYPZ	TOP CABINET	B8	THN1948-2	NUT
M6	PAKU330300	REAR COVER	B10	XTN3+6FZ	TAPPING SCREW
M7	TKK139208-1	HANDLE	B11	XTW3+8L	TAPPING SCREW
M8	PAKK358201-1	HANDLE COVER	B12	XYA4+EF8	SCREW
M9	TTEA0008	ESCUTCHEON	G1	PAPD351009-1	CUSHION (TOP FRONT)
M10	TBX1353500	KNOB (POWER/VOL)	G2	PAPD351010-1	CUSHION (TOP REAR)
Δ M14	TLK159025N	DEGAUSS COIL	G3	PAPD352009-1	CUSHION (BOTTOM FRONT)
M16	PAMX35902	BRACKET	G4	PAPD352010-1	CUSHION (BOTTOM REAR)
Δ M17	TUC24557-1	SHIELD CASE (DY)	G5	PAQF35237-3	CAUTION LABEL
M18	PAJB356002	TERMINAL BOARD	G6	PAQF37212	CAUTION LABEL
M19	TBX2783100	KNOB (SELECT)	G7	TES202-1	SPRING
M20	TMX13935-1	SPEAKER BRACKET	G8	TJC6319	FUSE HOLDER, LARGE
Δ M21	TSXA114	AC POWER CORD	G9	TMM13902	SPACER
M22	TMM14416	CORD BUSHING	G10	TMM81416	CORD BAND (SMALL)
M23	PAKS35301	BASE FRAME	G11	TPCA63701	PACKING CASE
M24	TBL173302	FOOT	G12	TPE114115-1	SET COVER
M25	TBMD301	MODEL NAME PLATE	G13	TQF57277	LABEL
M31	TJS169070	CONNECTOR	G14	TQF86202	LABEL
M33	TJS169071	3P CONNECTOR	G15	TQZB664	INSTRUCTION B00K
M34	TMM15511	DY WEDGE	INTEGRATED CIRCUITS		
U1	TMM6428-1	CLAMPER	IC201	AN5265	LINEAR IC
U2	TMM16452	CLAMPER	IC401	AN5436N	LINEAR IC
U4	TMM15412-1	CLAMPER	IC402	AN5515X	LINEAR IC
U5	TMM13497	CLAMPER	IC501	MC14503BCP	IC
U6	TMM6434	PLASTIC SPACER	IC502	UPC78M12AHF	LINEAR IC
U7	TMM6463-1	CLAMPER	IC601	AN5316N	LINEAR IC

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
TRANSISTORS					
Q201	2SC3311A	TRANSISTOR	D506	AU01Z	DIODE
Q202	2SC3311A	TRANSISTOR	D507	TVSES1	DIODE
Q308	2SA1309A	TRANSISTOR	D508	TVSRGP10J	DIODE
Q351	2SC1473QNC	TRANSISTOR	D509	MA165	DIODE
Q352	2SC1473QNC	TRANSISTOR	D510	TVSRGP10J	DIODE
Q353	2SC1473QNC	TRANSISTOR	D511	MA27WA	DIODE
Q371	2SC3311A	TRANSISTOR	D512	TVSRD12EBM	ZENER DIODE
Q372	2SC3311A	TRANSISTOR	D514	MA165	DIODE
Q373	2SC3311A	TRANSISTOR	D515	MA165	DIODE
Q374	2SC3311A	TRANSISTOR	D516	MA165	DIODE
Q375	2SC3311A	TRANSISTOR	D517	MA165	DIODE
Q380	2SC3311A	TRANSISTOR	D518	MA165	DIODE
Q401	2SC1383R	TRANSISTOR	D520	MA27WA	DIODE
Q402	2SA1309A	TRANSISTOR	D524	MA165	DIODE
Q403	2SC3311A	TRANSISTOR	D551	MA165	DIODE
Q501	2SC1473A	TRANSISTOR	D552	RD9.1ESAB2	ZENER DIODE
Q502	2SD1439	TRANSISTOR	D553	MA165	DIODE
Q504	2SC3311A	TRANSISTOR	D554	RD5.1ESAB2	ZENER DIODE
Q505	2SC3311A	TRANSISTOR	D601	MA165	DIODE
Q506	2SC3311A	TRANSISTOR	D602	MA165	DIODE
Q507	2SC3311A	TRANSISTOR	D801	TVSRM10B	DIODE
Q508	2SB774	TRANSISTOR	D802	TVSRM10B	DIODE
Q509	2SA1309A	TRANSISTOR	D803	TVSRM10B	DIODE
Q510	2SD889	TRANSISTOR	D804	TVSRM10B	DIODE
Q511	2SA1309A	TRANSISTOR	D805	MA171	DIODE
Q512	2SA1309A	TRANSISTOR	D806	MA1068L	ZENER DIODE
Q513	2SD1266	TRANSISTOR	D808	TVSES1Z	DIODE
Q514	2SC3311A	TRANSISTOR	D809	IN4003	DIODE
Q515	2SD889	TRANSISTOR	D810	TVSRGP10J	DIODE
Q551	2SA1309A	TRANSISTOR	D811	ERB44-08	DIODE
Q602	2SA1309A	TRANSISTOR	D812	TVSRGP10J	DIODE
Q603	2SA1309A	TRANSISTOR	D813	TVSSR2KN	DIODE
Q610	2SC3311A	TRANSISTOR	D814	ERPZ4B0M100B	POSISTOR
Q611	2SC3311A	TRANSISTOR	D815	LN38GP	LED (GREEN)
Q801	2SC3872-LS	TRANSISTOR	D816	TVSRGP10J	DIODE
Q802	2SB1322A	TRANSISTOR	D817	P6KE130A	DIODE
Q803	2SD965	TRANSISTOR	D3001	MA4056M	ZENER DIODE
Q804	2SC3311A	TRANSISTOR	D3002	MA165	DIODE
Q3001	2SC3311A	TRANSISTOR	D3003	MA4056M	ZENER DIODE
Q3002	2SC3311A	TRANSISTOR	D3004	MA165	DIODE
Q3003	2SC3311A	TRANSISTOR	D3005	MA4056M	ZENER DIODE
Q3004	2SA1309A	TRANSISTOR	D3006	MA165	DIODE
Q3005	2SA1309A	TRANSISTOR	D3007	MA27T-B	DIODE
Q3007	2SC3311A	TRANSISTOR	D3008	MA4056M	ZENER DIODE
Q3008	2SC3311A	TRANSISTOR	D3009	MA165	DIODE
Q3009	2SA1309A	TRANSISTOR	D3010	MA165	DIODE
			D3011	MA4056M	ZENER DIODE
			D3012	MA165	DIODE
DIODES			COILS		
D310	MA165	DIODE	L304	TLK817E	DELAY LINE
D314	MA165	DIODE	L306	TLT470K266	PEAKING COIL
D315	MA165	DIODE	L371	EFDBN645B95G	DELAY LINE
D401	TVSRD15EB1	ZENER DIODE	L372	EIK1EG024B	VIF COIL
D402	MA165	DIODE	L502	ELH5L424	LINEARITY COIL
D403	TVSEM1Z	DIODE	L504	TLUABTA151K	PEAKING COIL
D404	MA165	DIODE	L505	TLT100K991K	PEAKING COIL 10U
D405	TVSRD24EB1	ZENER DIODE	L506	TLTAMSKI103K	PEAKING COIL
D406	MA27TA	DIODE	L507	TLP13113E	CHOKE COIL
D407	MA165	DIODE	L601	TLUABTA150K	PEAKING COIL
D408	MA165	DIODE	L603	TLT222K993G	PEAKING COIL
D409	MA165	DIODE	L801	ELF18D216	LINE FILTER
D501	MA165	DIODE	L803	TSC928-4	CHOKE COIL
D503	ES-01F	DIODE			
D504	TVSRGP10J	DIODE			
D505	MA167	DIODE			

Ref. No.				Part No.				Description			
				TRANSFORMERS							
△	T501	PALF34709F	FLYBACK TRANS								
	T502	TLH15412	H.DRIVE TRANS.								
△	T801	ETS35K403A	SW POWER TRANSFOR								
				RESISTORS							
△	R201	ERJ8GEYJ472	M 4.7KOHM, J, 1/8W								
	R202	ERJ8GEYJ103	M 10KOHM, J, 1/8W								
	R203	ERJ8GEYJ153	M 15KOHM, J, 1/8W								
	R204	ERDS2TJ472	C 4.7KOHM, J, 1/4W								
	R205	ERJ8GEYJ103	M 10KOHM, J, 1/8W								
	R206	ERJ8GEYJ153	M 15KOHM, J, 1/8W								
	R207	ERJ8GEYJ104	M 100KOHM, J, 1/8W								
	R208	ERDS2TJ102	C 1KOHM, J, 1/4W								
	R209	ERJ8GEYJ102	M 1KOHM, J, 1/8W								
	R210	ERJ8GEYJ182	M 1.8KOHM, J, 1/8W								
	R211	ERJ8GEYJ821	M 820 OHM, J, 1/8W								
	R212	ERJ8GEYJ4R7	M 4.7 OHM, J, 1/8W								
	R213	ERJ8GEYJ561	M 560 OHM, J, 1/8W								
	R214	ERJ8GEYJ822	M 8.2KOHM, J, 1/8W								
	R215	ERDS2TJ272	C 2.7KOHM, J, 1/4W								
	R218	ERJ8GEYJ273	M 27KOHM, J, 1/8W								
	R219	ERJ8GEYJ273	M 27KOHM, J, 1/8W								
	R220	ERQ12AJ100P	F 10 OHM, J, 1/2W								
	R222	ERJ8GEYJ272	M 2.7KOHM, J, 1/8W								
	R310	ERDS2TJ391	C 390 OHM, J, 1/4W								
	R311	ERDS2TJ391	C 390 OHM, J, 1/4W								
	R312	ERDS2TJ391	C 390 OHM, J, 1/4W								
	R318	ERDS2TJ221	C 220 OHM, J, 1/4W								
	R320	ERJ8GEYJ822	M 8.2KOHM, J, 1/8W								
	R323	ERJ8GEYJ272	M 2.7KOHM, J, 1/8W								
	R324	ERJ8GEYJ272	M 2.7KOHM, J, 1/8W								
	R325	ERJ8GEYJ272	M 2.7KOHM, J, 1/8W								
	R326	ERDS2TJ101	C 100 OHM, J, 1/4W								
	R327	EVMEASA00B13	CONTROL 1KOHMB								
	R329	ERJ8GEYJ102	M 1KOHM, J, 1/8W								
	R330	EVND2AA03B14	CONTROL 10KOHMB								
	R331	EVMEASA00B24	CONTROL 20KOHM								
	R332	ERJ8GEYJ152	M 1.5KOHM, J, 1/8W								
	R333	EROS2CKF1002	M 10KOHM, F, 1/4W								
	R334	ERJ8GEYJ154	M 150KOHM, J, 1/8W								
	R335	ERJ8GEYJ562	M 5.6KOHM, J, 1/8W								
	R336	ERDS2TJ561	C 560 OHM, J, 1/4W								
	R337	ERJ8GEYJ273	M 27KOHM, J, 1/8W								
	R338	ERJ8GEYJ682	M 6.8KOHM, J, 1/8W								
	R339	ERDS2TJ333	C 33KOHM, J, 1/4W								
R340	ERJ8GEYJ153	M 15KOHM, J, 1/8W									
R341	ERDS2TJ561	C 560 OHM, J, 1/4W									
R342	ERDS2TJ122	C 1.2KOHM, J, 1/4W									
R343	ERJ8GEYJ472	M 4.7KOHM, J, 1/8W									
R344	EVUE30E25B14	CONTROL 10KOHMB									
R345	ERDS2TJ122	C 1.2KOHM, J, 1/4W									
R346	ERJ8GEYJ222	M 2.2KOHM, J, 1/8W									
R347	ERDS2TJ101	C 100 OHM, J, 1/4W									
R349	ERDS2TJ102	C 1KOHM, J, 1/4W									
R350	EVUE30E25B13	CONTROL 1KOHMB									
R351	EVN65UA00B53	CONTROL 5KOHMB									
R352	ERDS2TJ122	C 1.2KOHM, J, 1/4W									
R353	EVN65UA00B53	CONTROL 5KOHMB									
R354	ERDS2TJ122	C 1.2KOHM, J, 1/4W									
R355	ERDS2TJ183	C 18KOHM, J, 1/4W									
R356	EVN65UA00B13	CONTROL 1KOHMB									
R357	EVN65UA00B13	CONTROL 1KOHMB									
R358	ERDS2TJ471	C 470 OHM, J, 1/4W									
R359	ERDS2TJ151	C 150 OHM, J, 1/4W									

	Ref. No.	Part No.	Description		Ref. No.	Part No.	Description
△	R515	ERG2ANJ122	M 1.2KOHM, J, 2W		R614	ERDS2TJ101	C 100 OHM, J, 1/4W
	R516	ERQ1AJP561S	F 560 OHM, J, 1W		R615	ERDS2TJ101	C 100 OHM, J, 1/4W
	R517	ERG2ANJ122	M 1.2KOHM, J, 2W		R616	ERJ8GEYJ105	M 1MOHM, J, 1/8W
△	R518	ERQ1AJP561S	F 560 OHM, J, 1W		R617	ERDS2TJ474	C 470KOHM, J, 1/4W
△	R519	ERQ14AJ680P	F 68 OHM, J, 1/4W		R618	ERDS2TJ473	C 47KOHM, J, 1/4W
	R520	EVMJ6U10KB14	CONTROL 10KOHMB		R620	ERDS2TJ473	C 47KOHM, J, 1/4W
	R521	ERDS2TJ103	C 10KOHM, J, 1/4W		R622	ERJ8GEYJ332	M 3.3KOHM, J, 1/8W
△	R522	ERDS2TJ103	C 10KOHM, J, 1/4W		R623	ERDS2TJ103	C 10KOHM, J, 1/4W
△	R523	ER0S2CKF2001	M 2KOHM, F, 1/4W		R624	ERJ8GEYJ563	M 56KOHM, J, 1/8W
△	R524	ER0S2CKF1271	M 1.27KOHM, F, 1/4W		R650	ERJ8GEYJ822	M 8.2KOHM, J, 1/8W
	R526	ERJ8GEYJ472	M 4.7KOHM, J, 1/8W		R651	ERJ8GEYJ393	M 39KOHM, J, 1/8W
	R527	ERDS2TJ392	C 3.9KOHM, J, 1/4W		R652	ERJ8GEYJ102	M 1KOHM, J, 1/8W
△	R528	ERQ12HJ6R8	F 6.8 OHM, J, 1/2W		R653	ERJ8GEYJ101	M 100 OHM, J, 1/8W
△	R529	ERQ12AZJ1R0P	F 1.0 OHM, J, 1/2W		R654	ERDS2TJ822	C 8.2KOHM, J, 1/4W
△	R530	ERQ12HJ1R0	F 1 OHM, J, 1/2W		R655	ERDS2TJ393	C 39KOHM, J, 1/4W
	R531	ERD25FJ1R0	C 1 OHM, J, 1/4W	△	R801	ERF3AK2R7	W 2.7 OHM, 3W
	R532	ERDS2TJ223	C 22KOHM, J, 1/4W		R803	ERG1ANJ683H	M 68KOHM, J, 1W
	R533	ERD25FJ1R0	C 1 OHM, J, 1/4W	△	R804	ER0S2CKF1431	M 1.43KOHM, F, 1/4W
	R541	ERJ8GEYJ102	M 1KOHM, J, 1/8W	△	R805	ER0S2CKF2001	M 2KOHM, F, 1/4W
	R542	ERDS2TJ471	C 470 OHM, J, 1/4W	△	R806	ERDS2TJ331	C 330 OHM, J, 1/4W
	R543	ERDS2TJ564	C 560KOHM, J, 1/4W	△	R807	EVND4AA00B14	CONTROL 10KOHMB
	R544	ERDS2TJ392	C 3.9KOHM, J, 1/4W	△	R808	ER0S2CKF2261	M 2.26KOHM, F, 1/4W
	R545	ERDS2TJ102	C 1KOHM, J, 1/4W		R809	ERG1SJ331P	M 330 OHM, J, 1W
	R547	ERJ8GEYJ102	M 1KOHM, J, 1/8W		R810	ERG1SJ221P	M 220 OHM, J, 1W
	R548	ERJ8GEYJ562	M 5.6KOHM, J, 1/8W		R812	ERG1SJ271	M 270 OHM, J, 1W
	R549	ERDS2TJ102	C 1KOHM, J, 1/4W		R813	ERG2ANJ330H	M 33 OHM, J, 2W
	R550	ERJ8GEYJ223	M 22KOHM, J, 1/8W		R814	ERX1ANJPR47S	M 0.47OHM, J, 1W
	R551	ERJ8GEYJ392	M 3.9KOHM, J, 1/8W		R815	ERDS2TJ102	C 1KOHM, J, 1/4W
	R552	ERJ8GEYJ102	M 1KOHM, J, 1/8W		R816	ERDS2TJ102	C 1KOHM, J, 1/4W
	R554	ERDS2TJ823	C 82KOHM, J, 1/4W	△	R818	ERQ12HJ1R0	F 1 OHM, J, 1/2W
	R555	EVND2AA03B14	CONTROL 10KOHMB		R819	ERD25TJ152	C 1.5KOHM, J, 1/4W
	R556	ERDS2TJ153	C 15KOHM, J, 1/4W	△	R821	ERDS1TJ563	C 56KOHM, J, 1/2W
	R557	ERJ8GEYJ223	M 22KOHM, J, 1/8W		R822	ERQ14AJ2R2P	F 2.2 OHM, J, 1/4W
	R558	ERDS2TJ472	C 4.7KOHM, J, 1/4W		R823	ERJ8GEYJ562	M 5.6KOHM, J, 1/8W
	R559	ERDS2TJ102	C 1KOHM, J, 1/4W		R3001	ERJ8GEYJ101	M 100 OHM, J, 1/8W
	R560	ERDS2TJ104	C 100KOHM, J, 1/4W		R3002	ERJ8GEYJ822	M 8.2KOHM, J, 1/8W
	R561	ERJ8GEYJ103	M 10KOHM, J, 1/8W		R3003	ERJ8GEYJ393	M 39KOHM, J, 1/8W
	R562	ERJ8GEYJ104	M 100KOHM, J, 1/8W		R3004	ERJ8GEYJ101	M 100 OHM, J, 1/8W
	R563	ERJ8GEYJ103	M 10KOHM, J, 1/8W		R3005	ERJ8GEYJ822	M 8.2KOHM, J, 1/8W
	R564	ERJ8GEYJ473	M 47KOHM, J, 1/8W		R3006	ERJ8GEYJ393	M 39KOHM, J, 1/8W
	R565	ERDS2TJ473	C 47KOHM, J, 1/4W		R3007	ERJ8GEYJ102	M 1KOHM, J, 1/8W
	R566	EVND4AA00B24	CONTROL 20KOHMB		R3008	ERJ8GEYJ750	M 75 OHM, J, 1/8W
	R567	ERDS2TJ333	C 33KOHM, J, 1/4W		R3009	ERJ8GEYJ750	M 75 OHM, J, 1/8W
	R568	ERJ8GEYJ223	M 22KOHM, J, 1/8W		R3010	ERJ8GEYJ750	M 75 OHM, J, 1/8W
	R569	ERJ8GEYJ272	M 2.7KOHM, J, 1/8W		R3011	ERJ8GEYJ562	M 5.6KOHM, J, 1/8W
	R570	ERD25TJ562	C 5.6KOHM, J, 1/4W		R3012	ERJ8GEYJ562	M 5.6KOHM, J, 1/8W
	R571	ERJ8GEYJ152	M 1.5KOHM, J, 1/8W		R3013	ERDS2TJ471	C 470 OHM, J, 1/4W
△	R572	ERQ12HJ100	F 10 OHM, J, 1/2W		R3014	ERJ8GEYJ821	M 820 OHM, J, 1/8W
	R573	ERDS2TJ472	C 4.7KOHM, J, 1/4W		R3015	ERJ8GEYJ224	M 220KOHM, J, 1/8W
	R574	ERDS2TJ102	C 1KOHM, J, 1/4W		R3016	ERJ8GEYJ272	M 2.7KOHM, J, 1/8W
	R576	ERDS2TJ822	C 8.2KOHM, J, 1/4W		R3017	ERJ8GEYJ271	M 270 OHM, J, 1/8W
	R577	ERDS2TJ103	C 10KOHM, J, 1/4W		R3018	ERJ8GEYJ471	M 470 OHM, J, 1/8W
	R578	ERDS2TJ102	C 1KOHM, J, 1/4W		R3019	ERJ8GEYJ750	M 75 OHM, J, 1/8W
	R579	ERJ8GEYJ223	M 22KOHM, J, 1/8W		R3020	ERJ8GEYJ101	M 100 OHM, J, 1/8W
	R580	ERDS2TJ223	C 22KOHM, J, 1/4W		R3021	ERJ8GEYJ822	M 8.2KOHM, J, 1/8W
	R581	ERDS2TJ274	C 270KOHM, J, 1/4W		R3022	ERJ8GEYJ393	M 39KOHM, J, 1/8W
	R601	ERJ8GEYJ561	M 560 OHM, J, 1/8W		R3023	ERJ8GEYJ102	M 1KOHM, J, 1/8W
	R602	ERJ8GEYJ331	M 330 OHM, J, 1/8W		R3024	ERJ8GEYJ101	M 100 OHM, J, 1/8W
	R603	ERJ8GEYJ152	M 1.5KOHM, J, 1/8W		R3025	ERJ8GEYJ822	M 8.2KOHM, J, 1/8W
	R604	ERDS2TJ561	C 560 OHM, J, 1/4W		R3026	ERJ8GEYJ393	M 39KOHM, J, 1/8W
	R605	ERJ8GEYJ224	M 220KOHM, J, 1/8W		R3027	ERJ8GEYJ750	M 75 OHM, J, 1/8W
	R606	ERDS2TJ104	C 100KOHM, J, 1/4W		R3028	ERJ8GEYJ101	M 100 OHM, J, 1/8W
	R607	EVND2AA03B14	CONTROL 10KOHMB		R3029	ERJ8GEYJ392	M 3.9KOHM, J, 1/8W
	R608	ERDS2TJ152	C 1.5KOHM, J, 1/4W		R3030	ERJ8GEYJ564	M 560 OHM, J, 1/8W
	R609	ERDS2TJ332	C 3.3KOHM, J, 1/4W		R3031	ERJ8GEYJ102	M 1KOHM, J, 1/8W
	R610	ERDS2TJ153	C 15KOHM, J, 1/4W		R3032	ERJ8GEYJ331	M 330 OHM, J, 1/8W
	R611	EVUE20E25B14	CONTROL 10KOHMB				
	R612	ERJ8GEYJ273	M 27KOHM, J, 1/8W				
	R613	EVUE20E25B14	CONTROL 10 OHMB				

Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
CAPACITORS					
C201	ECA1HM010	E 1UF, 50V	△	C513	ECKD3D102JBN C 1000PF, J, 2KV
C202	ECA1HM010	E 1UF, 50V	△	C514	ECKD3D102JBN C 1000PF, J, 2KV
C203	ECA1HM100	E 10UF, 50V	△	C515	ECKD3D152JBN C 1500PF, J, 2KV
C204	ECA1HM4R7G	E 4.7UF, 50V	△	C519	ECQM4822JZ P 8200PF, J, 400V
C206	ECA1HM100	E 10UF, 50V	△	C520	ECQF2H184JZA P 0.18UF, J, 200V
C207	ECUX1H103ZFX	C 0.01UF, Z, 50V	△	C521	ECA2EM3R3 E 3.3UF, 250V
C208	ECA1HM2R2	E 2.2UF, 50V	△	C522	ECA2CM101E E 100UF, 160V
C209	ECUX1H104ZFW	C 0.1UF, Z, 50V	△	C523	ECA1VM221G E 220UF, 35V
C210	ECA1VM221G	E 220UF, 35V	△	C524	ECA1VM331 E 330UF, 35V
C211	ECA1VM221G	E 220UF, 35V	△	C525	ECA1HM100 E 10UF, 50V
C212	ECA1CM221	E 220UF, 16V	△	C526	ECA1HM330 E 33UF, 50V
C213	ECUX1H103ZFX	C 0.01UF, Z, 50V	△	C528	ECA1HM2R2 E 2.2UF, 50V
C214	ECA1HM100	E 10UF, 50V	△	C529	ECUX1H391KBX C 390PF, K, 50V
C215	ECA1HM100	E 10UF, 50V	△	C530	ECUX1H221KBM C 220PF, K, 50V
C216	ECA1CM221	E 220UF, 16V	△	C531	ECCF1H560J C 56PF, J, 50V
C308	ECUX1H180JCM	C 18PF, J, 50V	△	C532	ECQP1H472JZ P 4700PF, J, 50V
C311	ECA1HM100	E 10UF, 50V	△	C533	ECUX1H221KBM C 220PF, K, 50V
C312	ECUX1H121KCM	C 120PF, K, 50V	△	C534	ECA1HW4R7UE E 4.7UF, 50V
C314	ECA1HM100	E 10UF, 50V	△	C535	ECUX1H151KCM C 150PF, K, 50V
C315	ECA1HM4R7G	E 4.7UF, 50V	△	C536	ECUX1H391KBX C 390PF, K, 50V
C316	ECA1HM100	E 10UF, 50V	△	C537	ECA1VM470 E 47UF, 35V
C317	ECA1HM3R3G	E 3.3UF, 50V	△	C538	ECKF1H331KB C 330PF, K, 50V
C318	ECA1HM100	E 10UF, 50V	△	C539	ECUX1H331KBX C 330PF, K, 50V
C320	ECA1CM102	E 1000UF, 16V	△	C551	ECA1EM101 E 100UF, 25V
C351	ECKF1H331KB	C 330PF, K, 50V	△	C552	ECA1HM220 E 22UF, 50V
C352	ECKF1H221KB	C 220PF, K, 50V	△	C601	ECUX1H560JCW C 56PF, J, 50V
C353	ECKD3D681KBP	C 680PF, K, 2KV	△	C602	ECUX1H104ZFW C 0.1UF, Z, 50V
C358	ECKF1H221KB	C 220PF, K, 50V	△	C604	ECKF1H103ZF C 0.01UF, Z, 50V
C371	ECA1HM220	E 22UF, 50V	△	C605	ECQB1H273KF P 0.027UF, K, 50V
C372	ECUX1H103ZFW	C 0.01UF, Z, 50V	△	C606	ECA1HMR47G E 0.47UF, 50V
C373	ECUX1H103ZFW	C 0.01UF, Z, 50V	△	C607	ECEA1HN4R7U E 4.7UF, 50V
C374	ECUX1H333KBX	C 0.033UF, K, 50V	△	C608	ECA1HMR22G E 0.22UF, 50V
C375	ECA2CM4R7	E 4.7UF, 160V	△	C609	ECQB1H393KF P 0.039UF, K, 50V
C378	ECUX1H333KBX	C 0.033UF, K, 50V	△	C610	ECUX1H470JCX C 47PF, J, 50V
C381	ECUX1H391KBX	C 390PF, K, 50V	△	C611	ECUX1H050DCW C 5 PF, D, 50V
C382	ECUX1H391KBX	C 390PF, K, 50V	△	C612	ECA1HM2R2 E 2.2UF, 50V
C383	ECUX1H391KBX	C 390PF, K, 50V	△	C614	ECUX1H152KBW C 1500PF, J, 50V
C401	ECA1CM221	E 220UF, 16V	△	C615	ECA1HM100 E 10UF, 50V
C402	ECUX1H103ZFW	C 0.01UF, Z, 50V	△	C650	ECA1HM100 E 10UF, 50V
C403	ECQB1H273KF	P 0.027UF, K, 50V	△	C651	ECA1HM100 E 10UF, 50V
C404	ECF1CE225	T 2.2UF, 16V	△	C652	ECA1HM100 E 10UF, 50V
C405	ECF1CE335	T 3.3UF, 16V	△	C653	ECA1HM100 E 10UF, 50V
C406	ECUX1H472KBW	C 4700PF, K, 50V	△	C801	ECQU1A333MH P 0.033UF, M, 1 25V
C407	ECA1HM100	E 10UF, 50V	△	C802	ECQU1A333MH P 0.033UF, M, 1 25V
C408	ECA1HM4R7G	E 4.7UF, 50V	△	C803	ECKDNB472ME C 4700PF, M
C410	ECA1CM102	E 1000UF, 16V	△	C805	ECKD2H103PU7 C 0.01UF, 500V
C411	ECUX1H472KBW	C 4700PF, K, 50V	△	C806	ECKD2H103PU7 C 0.01UF, 500V
C412	ECA1HHG101	E 100UF, 50V	△	C807	ECKD2H103PU7 C 0.01UF, 500V
C413	ECQM1472KZ	P 4700PF, K, 100V	△	C809	EC0S2EP221BB E 220UF, 250V
C417	ECQB1H104KF	P 0.1UF, K, 50V	△	C810	ECQB1H104KF P 0.1UF, K, 50V
C418	ECKF1H102KB	C 1000PF, K, 50V	△	C811	ECA1HM470G E 47UF, 50V
C419	ECQB1H153KF	P 0.015UF, K, 50V	△	C812	ECA1HM4R7G E 4.7UF, 50V
C420	ECA1HM010	E 1UF, 50V	△	C813	ECKF1H221KB C 220PF, K, 50V
C421	ECA1HM010	E 1UF, 50V	△	C814	ECKDNB221MB C 200PF, M, 50V
C422	ECUX1H153KBM	C 0.015UF, K, 50V	△	C815	ECKDNB221MB C 200PF, M, 50V
C423	ECKF1H103ZF	C 0.01UF, Z, 50V	△	C816	ECKF1H103ZF C 0.01UF, Z, 50V
C424	ECUX1H473ZFX	C 0.047UF, Z, 50V	△	C819	ECA2CM221WE E 220UF, 160V
C503	ECA1HM2R2	E 2.2UF, 50V	△	C820	ECA1VM222 E 2200UF, 35V
C505	ECUX1H561KBM	C 560PF, K, 50V	△	C821	ECKD3D102KBP C 1000PF, K, 2KV
C506	ECQB1H153KF	P 0.015UF, K, 50V	△	C3001	ECA1HM100 E 10UF, 50V
C507	ECQB1H473KF	P 0.047UF, K, 50V	△	C3002	ECA1HM100 E 10UF, 50V
C508	ECQB1H223KF	P 0.022UF, K, 50V	△	C3003	ECA1HM100 E 10UF, 50V
C509	ECA1HM2R2	E 2.2UF, 50V	△	C3004	ECA1HM100 E 10UF, 50V
C510	ECQK1682JZ	P 6800PF, J, 100V	△	C3005	ECUX1H683ZFX C 0.68UF, Z, 50V
C511	ECA1EM101	E 100UF, 25V	△	C3006	ECUX1H683ZFX C 0.68UF, Z, 50V
C512	ECKD2H101KB2	C 100PF, K, 500V	△	C3007	ECUX1H470JCW C 47PF, J, 50V
			△	C3008	ECA1VM470 E 47UF, 35V
			△	C3010	ECA1HM100 E 10UF, 50V
			△	C3011	ECA1HM100 E 10UF, 50V

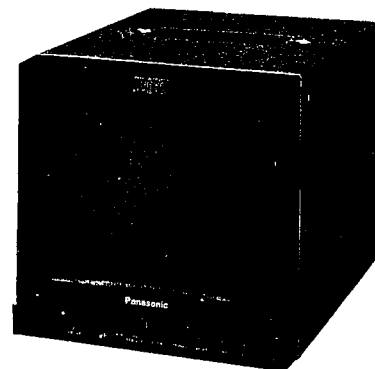
Ref. No.	Part No.	Description	Ref. No.	Part No.	Description
C3012	ECA1HM100	E 10UF, 50V			
C3013	ECA1HM100	E 10UF, 50V			
C3014	ECA1HM100	E 10UF, 50V			
C3015	ECUX1H221JCW	C 220PF, J, 50V			
OTHERS					
△	RTL	TNP30938ZB			CIRCUIT BOARD A
	RTL	TNP31434ZB			CIRCUIT BOARD C
	RTL	TNP31768ZB			CIRCUIT BOARD D
	RTL	TNP31769ZB			CIRCUIT BOARD L
△	F801	XBA1F30NU100			FUSE 125V 3A
	SW302	ESB621282			FUNCTION SWITCH
	SW401	EVQR4AL13			SERVICE SWITCH
	SW3001	SSFYP22-08B			SLIDE SWITCH (75Ω/High)
	SW3002	SSFYP22-08B			SLIDE SWITCH (VIDEO/S-VIDEO)
△	X601	TSS816N2			CRYSTAL
		TJS1A5081B			CRT SOCKET
		TJS168960			2P CONNECTOR
		TJS168980			4P CONNECTOR
		TJS169010			CONNECTOR
		TJS169060			2P CONNECTOR
		TJS5A9310			4P CONNECTOR
		TJS5A9330			6P CONNECTOR

Service Manual

Color Video Monitor

BT-S901Y

Chassis No. KMX-F903A



The service technician is required to read and follow the "Safety Precautions" and "Important Safety Notice" in this service manual.

Specifications

Power Input:	120V AC, 50/60 Hz	Sound Output:	1.0W (at 10% distortion) 1.2W (max.)
Power Consumption:	37 W (average)/0.75 A (max.)	Speaker:	2 1/2 inches round type Voice coil 16Ω
Video Input/Output:	S-Video signal <ul style="list-style-type: none">• 1.0Vp-p for Y signal• 0.3Vp-p for C signal• High or 75Ω switchable• 4P mini DIN type connector Video signal <ul style="list-style-type: none">• 1.0Vp-p ±10%• High or 75Ω automatic• BNC type connector	Automatic Circuits:	Automatic frequency and phase control Horizontal automatic frequency control Automatic degaussing Automatic Voltage regulator Automatic beam limiter
Audio Input/Output:	0.5Vrms ±10% 10kΩ (min.) RCA phono type connector	Picture Tube:	A22JWG34X 37square inches 9 inches measured diagonally 90° deflection, In-line
Ext. Sync Input/Output:	2.0~4.0Vp-p (negative) High or 75Ω automatic BNC type connector	Dimensions:	Width: 8 ²⁵ / ₃₂ inches (223mm) Depth: 12 ¹¹ / ₁₆ inches (321.5mm) Height: 9 inches (228.5mm)
Semiconductors:	45 transistors 64 diodes 1 posistor 6 ICs	Weight:	15.5 lbs. (7.0kg)
Anode Voltage:	22.0kV ±1 kV (at 0 beam current)		

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Specifications are subject to change without notice.

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THIS MODEL COMPLIES WITH DHHS RULES 21 CFR SUBCHAPTER J APPLICABLE AT DATE OF MANUFACTURE.

IMPORTANT SAFETY NOTICE

There are special components used in Panasonic Video Monitor sets which are important for safety. These parts are shaded on the schematic diagram and on the replacement parts list. It is essential that these critical parts should be replaced with manufacturer's specified parts **only** to prevent X-RADIATION, shock, fire, or other hazards. Do not modify the original design without permission of Panasonic Communications & Systems Company.

ABBREVIATIONS USED IN THIS MANUAL

ABL	Automatic Beam Limiter	CRT	Cathode Ray Tube
APC	Automatic Phase Control	FBT	Flyback Transformer
DY	Deflection Yoke	HAFC	Horizontal Automatic Frequency Control
OTL	Output Transformerless	ACC	Automatic Color Control
SEPP	Single Ended Push-Pull Circuit	VR	Variable Resistor
AVR	Automatic Voltage Regulator		

SAFETY PRECAUTIONS

GENERAL GUIDELINES

1. It is advisable to insert an isolation transformer in the power line and AC supply before servicing a hot chassis.
2. When servicing, observe the original lead dress, especially the lead dress in the high voltage circuits. If a short circuit is found, replace all parts which have been overheated or damaged by the short circuit.
3. After servicing, ensure that all the protective devices such as insulation barriers, insulation papers, shields, and isolation R-C combinations, are properly installed.

4. Before turning the monitor on, measure the resistance between B+ line and chassis ground. Connect \ominus side of an ohmmeter to the B+ lines, and \oplus side to chassis ground. Each line should have more resistance than specified, as follows:

B+ Line	Minimum Resistance
121V	140 Ω
27V	150 Ω
15V	150 Ω
12V	140 Ω

5. When the monitor is not to be used for a long period of time, unplug the power cord from the AC outlet.
6. Potentials, as high as 22.0kV are present when this monitor is in operation. Operation of the monitor without the rear cover involves the danger of a shock hazard from the monitor power supply. Servicing should not be attempted by anyone who is not thoroughly familiar with the precautions necessary when working on high voltage equipment. Always discharge the anode of the picture tube to the monitor chassis before handling the tube.
7. After servicing, perform the leakage current checks to prevent the customer from being exposed to shock hazards.

LEAKAGE CURRENT COLD CHECK

1. Unplug the AC cord and connect a jumper between the two prongs on the plug.
2. Turn on the monitor's power switch.
3. Measure the resistance value, with an ohmmeter, between the jumpered AC plug and each exposed metallic cabinet part on the monitor, such as screwheads, connectors, control shafts, handle bracket, etc.

When the exposed metallic part has a return path to the chassis, the reading should be between 240k Ω and 5.2M Ω .

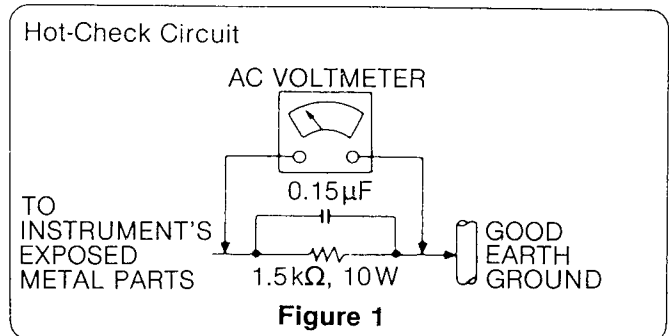
When the exposed metal does not have a return path to the chassis, the reading must be ∞ .

LEAKAGE CURRENT HOT CHECK

(See figure 1.)

1. Plug the AC cord directly into the AC outlet.
DO NOT use an isolation transformer for this check.
2. Connect a 1.5k Ω , 10 watt resistor, in parallel with a 0.15 μ F capacitor, between each exposed metallic part on the set and a good earth ground such as a water pipe, as shown in figure 1.
3. Use an AC voltmeter, with 1000 ohms/volt or more sensitivity, to measure the potential across the resistor.
4. Check each exposed metallic part, and measure the voltage at each point.

5. The potential at any point should not exceed 0.75 volts RMS. A leakage current tester (Simpson Model 229 or equivalent) may be used to make the hot check. Leakage current must not exceed 0.5 milliamp. If a measurement is outside of the specified limits, there is a possibility of a shock hazard, and the monitor should be repaired and rechecked before it is returned to the customer.



X-RADIATION

- WARNING:**
1. The potential source of X-Radiation in monitor sets is the High Voltage section and the picture tube.
 2. When using a picture tube test jig for service, ensure the jig is capable of handling 24.0kV without causing X-Radiation.

Note: It is important to use an accurate, periodically calibrated high voltage meter.

1. Turn Bright and Contrast controls fully counter-clockwise.
2. Set SERVICE switch to SERVICE position.
3. Measure the high voltage. The high voltage meter (electrostatic type) reading should indicate 22.0kV \pm 1.0kV. If the meter indication is out of tolerance, immediate service and correction is required to prevent the possibility of premature component failure.
4. To prevent an X-Radiation possibility, it is essential to use the specified picture tube.

HORIZONTAL OSC. DISABLE CIRCUIT TEST

SERVICE WARNING: This test must be made as a final check before the monitor is returned to the customer after repairs are made.

1. With rear cover removed, supply nominal 120V AC to the monitor and turn on power switch.
2. Receive a monoscope pattern signal and adjust user controls to normal position.
3. Turn off the power switch.
4. Connect 5k Ω control VR with its resistance maximum between TP92 and TP93.
5. Turn on the power switch again.
6. Turn the 5k Ω control VR slowly to decrease its resistance.
7. Confirm that the picture falls out of horizontal sync.
8. If the test fails, Horizontal Osc. Disable Circuit is not operating and must be repaired.

Refer to the Horizontal Osc. Disable Circuit Repair Procedure.

HORIZONTAL OSC. DISABLE CIRCUIT REPAIR PROCEDURE

- 1) Connect a DC voltmeter between the cathode of D510 and chassis ground of the main circuit board. If approximately 21V is not present on the cathode of D510, find the cause. Check R529, D510 and C525.
- 2) Connect a DC voltmeter between the cathode of D512 and chassis ground of the main circuit board. If approximately 12V is not present on the cathode of D512, find the cause. Check R524, R523 and D511.
- 3) Repeat step 2) procedure. If approximately 12V is present on the cathode, check D512, R522, Q504, R521 and IC401.
- 4) Carefully check above specified parts, and related circuits and parts. When the circuit is repaired, try the Horizontal Osc. Disable Circuit Test again.

HORIZONTAL OSC. DISABLE CIRCUIT EXPLANATION

1. Under normal operating conditions, zener diode D512 is CUT OFF since its breakdown voltage is not reached.
2. When the amplitude of the pulse applied to diode D510 increases, the cathode voltage of zener diode D512 rises, and D512 conducts.

3. The conduction of D512 increases the base voltage of Q504 and causes it to conduct.
4. This causes the pin ③ voltage of IC401 to decrease.

As a result the horizontal oscillator frequency goes higher and the picture on the screen falls out of horizontal sync.

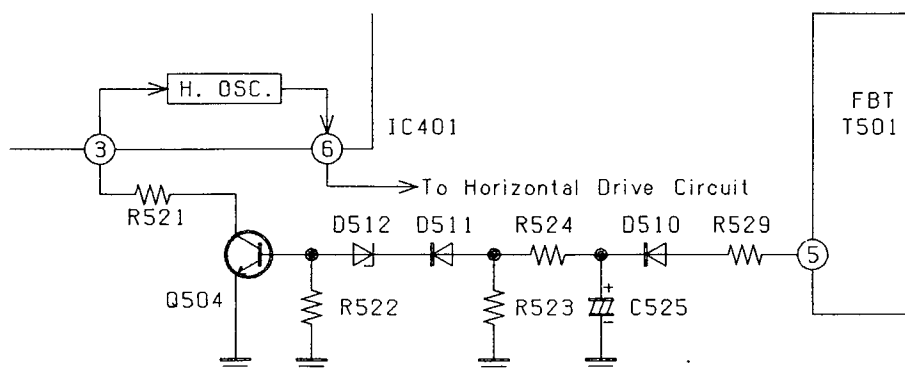
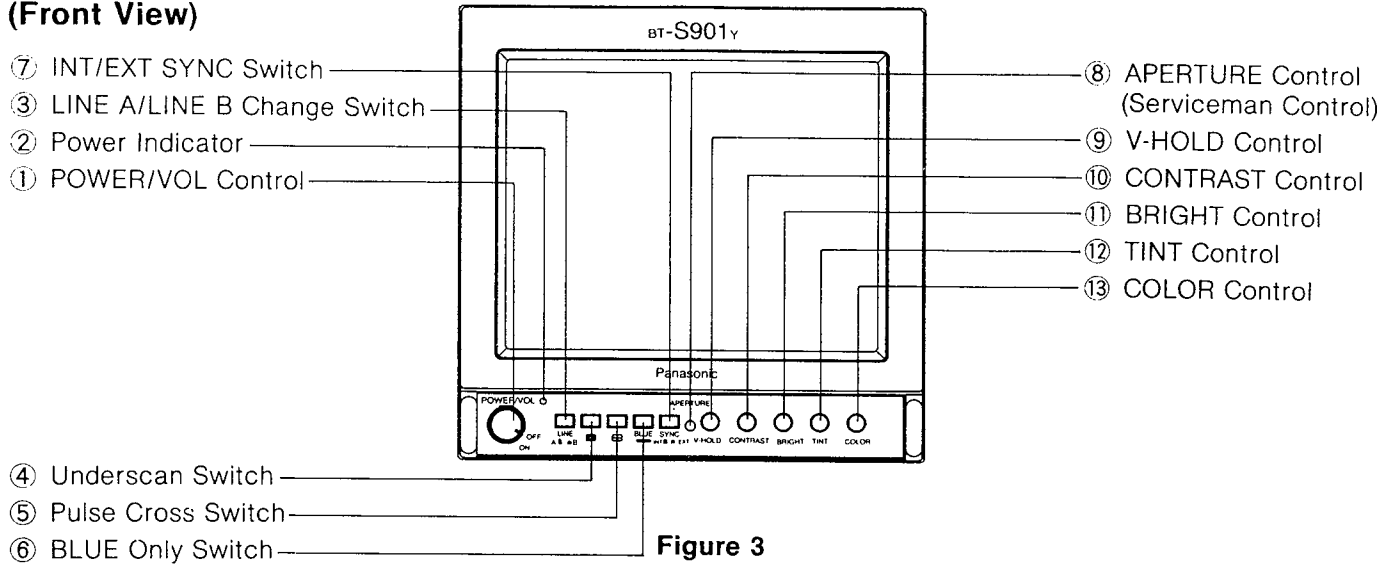


Figure 2

USER CONTROL LOCATIONS AND OPERATIONS

USER CONTROL LOCATIONS

(Front View)



OPERATIONS

① POWER/VOL Control	1. Turn clockwise to turn the monitor on. Turn counterclockwise to turn the monitor off. 2. Adjust this control for the appropriate audio level.
② Power Indicator	The Power Indicator will light when the monitor is turned on.
③ LINE A/LINE B Change Switch A ■ B ■	LINE A: Receives video signal from the VIDEO IN terminal or S-VIDEO signal from the S-VIDEO IN terminal, and audio signal from AUDIO IN terminal. LINE B: Receives video and audio signals from the VIDEO IN and AUDIO IN terminals.
④ Underscan Switch (□)	Decreases the overall picture size to allow the corners to be seen.
⑤ Pulse Cross Switch (⊕)	Receives cross pulse to allow vertical and horizontal syncs to be seen in the picture.
⑥ BLUE Only Switch (BLUE)	Defeats the red and green signals. This feature is used for monitor balancing with the SMPTE color bar signal.
⑦ INT/EXT SYNC Switch	Set the INT/EXT SYNC Switch to EXT Position when connecting an external composite sync signal to the monitor.
⑧ APERTURE Control (Serviceman Control)	Adjust the APERTURE control for proper sharpness. (Turn right for sharper picture.)
⑨ V-HOLD Control	Adjust the V-Hold control if the picture rolls up or down.
⑩ CONTRAST Control	Adjust the contrast level for proper overall contrast. There is a click position for normal level.
⑪ BRIGHT Control	Adjust the brightness level for proper overall picture brightness. There is a click position for normal level.
⑫ TINT Control	Adjust the Tint control for proper chroma phase of flesh tones.
⑬ COLOR Control	Adjust the Color control to set the chroma (saturation) level.

GENERAL CONNECTION AND APPLICATIONS

TERMINAL BOARD ON REAR COVER

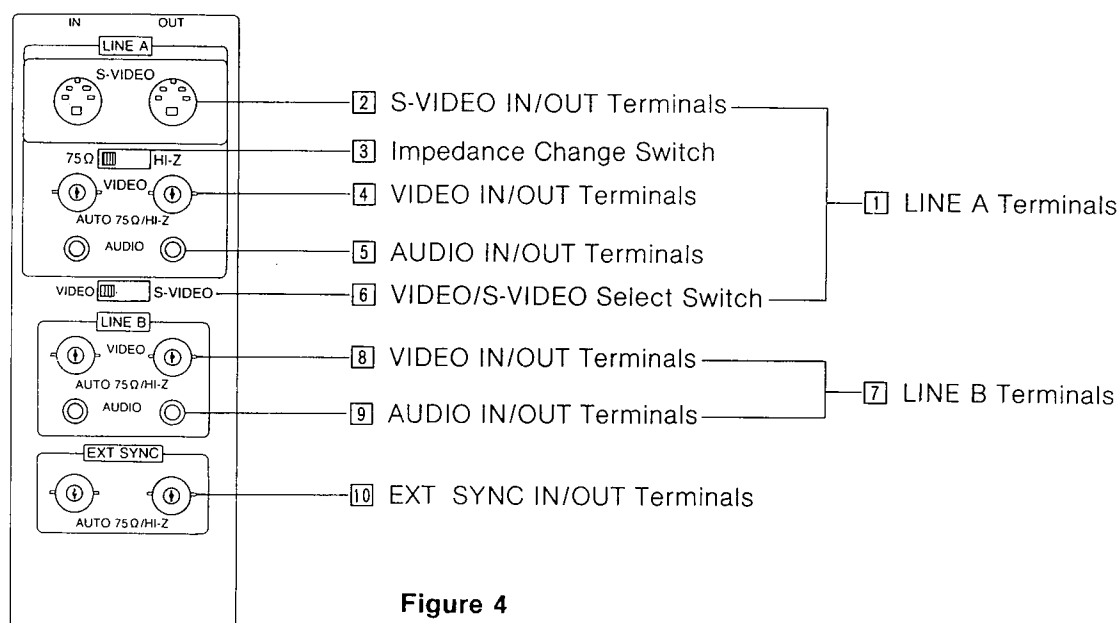


Figure 4

[1] LINE A Terminals	Available when LINE A / LINE B Change Switch on the front panel is set to "LINE A".
[2] S-VIDEO IN/OUT Terminals	Connect S-VIDEO signal to IN terminal. The same signal is available at the OUT terminal.
[3] Impedance Change Switch	Set this switch to 75Ω for the S-VIDEO termination or to HI-Z for bridge-connection to next unit.
[4] VIDEO IN/OUT Terminals	Connect video signal to IN terminal. The same signal is available at the OUT terminal.
[5] AUDIO IN/OUT Terminals	Connect audio signal to IN terminal. The same signal is available at the OUT terminal.
[6] VIDEO/S-VIDEO Select Switch	When the video signal is applied, set this switch to VIDEO position and when the S-VIDEO signal is applied, set this switch to S-VIDEO position.
[7] LINE B Terminals	Available when LINE A/LINE B Change Switch on the front panel is set to "LINE B".
[8] VIDEO IN/OUT Terminals	Connect video signal to IN terminal. The same signal is available at the OUT terminal.
[9] AUDIO IN/OUT Terminals	Connect audio signal to IN terminal. The same signal is available at the OUT terminal.
[10] EXT SYNC IN/OUT Terminals	Connect an external composite sync signal to this terminal when a non-composite video signal is applied to the video terminals ([4] or [8]).

- Note:**
1. The video and the external sync input/output terminals are equipped with "Automatic Termination Switch". If only input signal is applied, they are terminated by 75 ohm, and if both input/output signals applied, they are opened to high impedance.
 2. It is possible to connect up to 10 monitors in series by looping through the S-VIDEO IN and S-VIDEO OUT or the VIDEO IN and VIDEO OUT terminals. There may be a possibility of a brightness reduction or interference if more than 10 units are connected. Please carefully confirm that these problems do not exist with the units before connection.

SIGNAL LEVEL AND TERMINAL IMPEDANCE

Terminal \ Item		Level	Impedance	Remarks
S-VIDEO	INPUT	Y: 1.0Vp-p C: 0.3Vp-p	High/75Ω (Switchable)	Y signal includes sync signal and C signal does not include it
	OUTPUT	Y: 1.0Vp-p C: 0.3Vp-p	High/75Ω (Switchable)	
VIDEO	INPUT	1.0Vp-p (0.7Vp-p)	High/75Ω (Automatic)	Signal measures 1.0Vp-p with sync, or 0.7Vp-p without sync.
	OUTPUT	1.0Vp-p (0.7Vp-p)	High/75Ω (Automatic)	
AUDIO	INPUT	-6dB	10kΩ	1Vrms=0dB (at 400Hz)
	OUTPUT	-6dB	10kΩ	
EXT SYNC	INPUT	2.0~4.0Vp-p	High/75Ω (Automatic)	Negative vertical and horizontal sync
	OUTPUT	2.0~4.0Vp-p	High/75Ω (Automatic)	

Note: Only the S-VIDEO input/output terminals are not equipped with "Automatic Termination Switch".

If only the input terminal is used, the impedance change switch must be set to 75Ω, and if both input and output terminals are used, the impedance change switch must be set to HI-Z for high impedance.

CONNECTION TO OTHER EQUIPMENTS

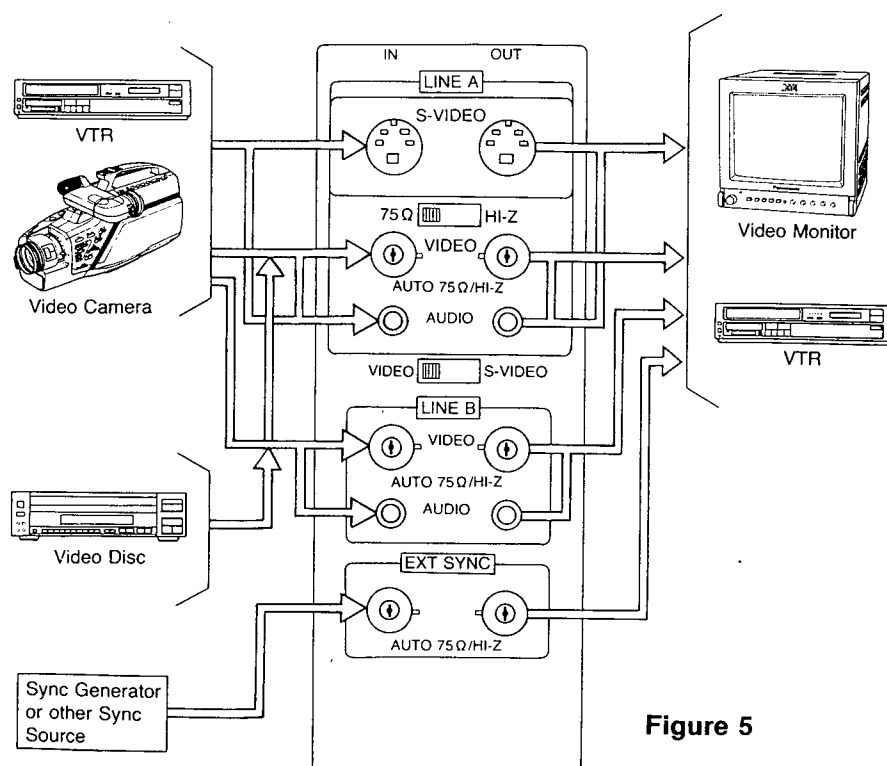


Figure 5

DISASSEMBLY INSTRUCTIONS

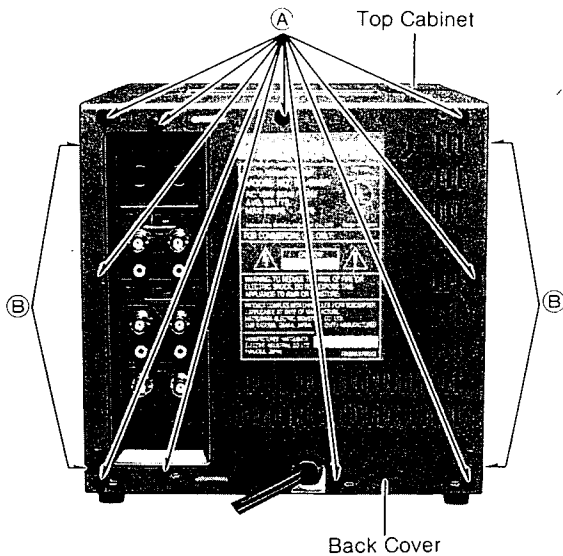


Figure 6

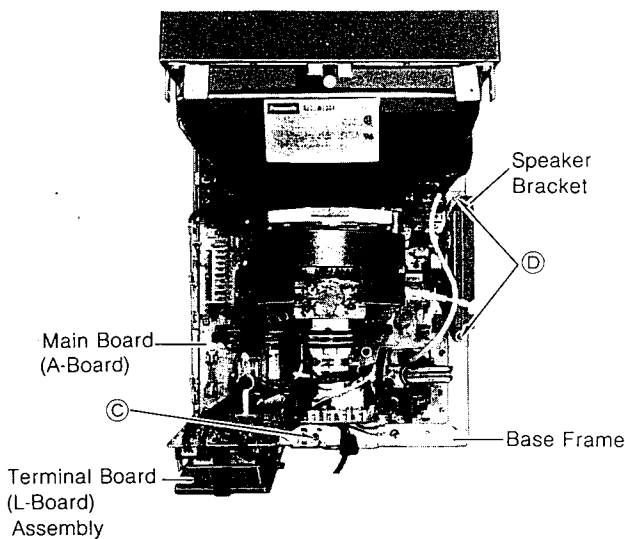


Figure 7

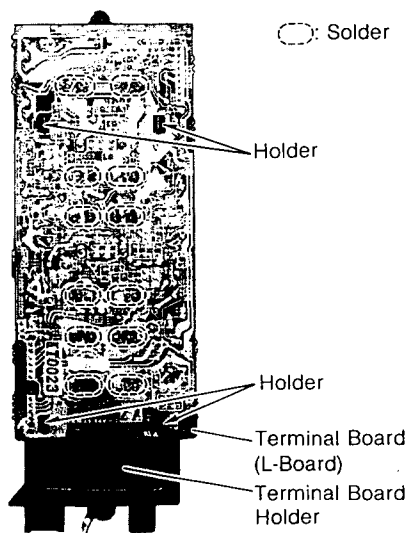


Figure 8

Caution: When servicing or replacing the CRT, it is important that the anode high voltage be completely discharged, as high voltage (1kV) may remain on the anode for an extended time after power off.

1. Back Cover Removal

- Remove 10 screws A from the back cover.
- Pull the back cover toward you and remove it.

Note: Remove only the screws A indicated by ⇐ mark and 4 screws B in order to remove back cover and top cabinet together.

2. Top Cabinet Removal

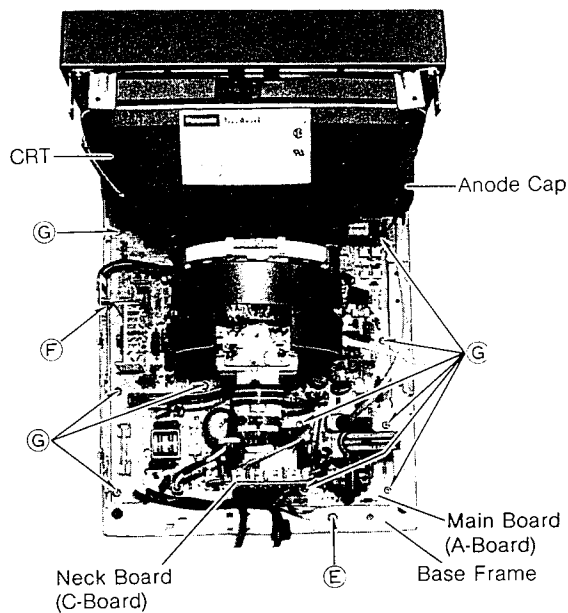
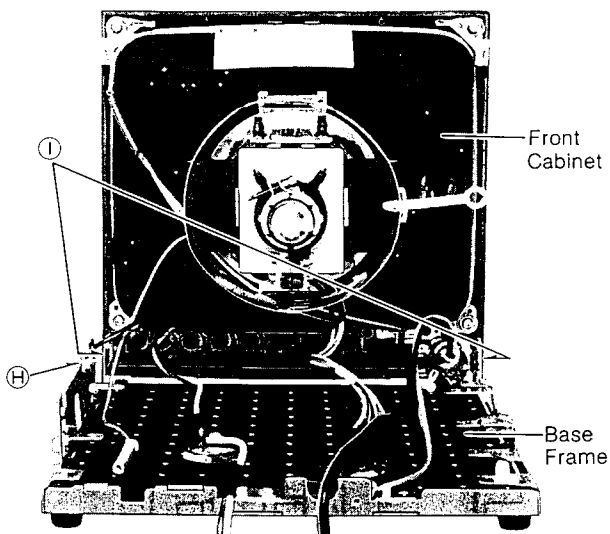
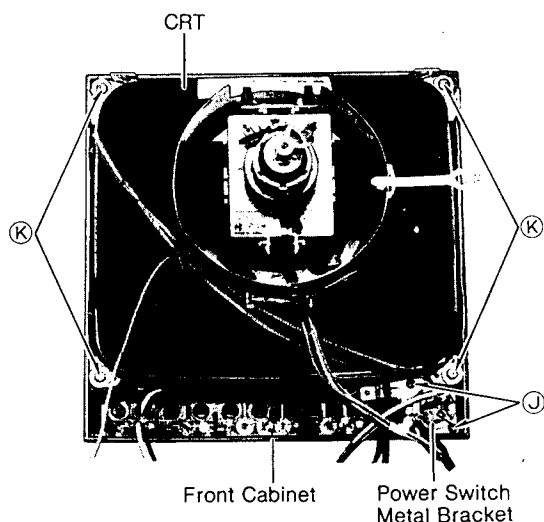
- Remove 4 screws B from the top cabinet, and then carefully pull the top cabinet toward you.

3. Terminal Board (L-Board) Removal

- Remove 1 screw C from the base frame.
- Disconnect connectors CO-1L, CO-2L, CO-3L, CO-4L and CO-5L from the terminal board (L-board) assembly.
- Remove the terminal board (L-board) assembly.
- Unsolder the points indicated in fig. 8 and remove the terminal board holder from the terminal board (L-Board).

4. Speaker Block Removal

- Remove 2 screws D from the speaker bracket.
- Remove the speaker block from the base frame.


Figure 9

Figure 10

Figure 11

5. Main Board (A-Board) Removal

- Disconnect the neck board (C-board) and the anode cap from the CRT.
- Disconnect the DY connector, degaussing coil connector, power switch connector (CO-1A) and LED board (D-board) connector (CO-5A) from the main board (A-board).
- Disconnect CRT grounding strap connector (CO-1C) from the neck board (C-board).
- Remove 2 screws ⑤ and ⑥ from the base frame.
- Remove 10 screws ⑦ from the main board (A-board).
- Remove the main board (A-board) from the base frame.

6. Base Frame Removal

- Remove the power switch knob from the front cabinet.
- Remove 1 screw ⑧ from the base frame.
- Place the unit with the CRT face down on a rubber mat or other soft surface to protect the CRT and the cabinet.
- Remove 2 screws ① from the front cabinet.
- Remove the base frame from the front cabinet.

7. Power Switch Block and CRT Removal

- Remove 2 screws ⑨ from the power switch metal bracket.
- Remove the power switch metal bracket from the front cabinet.
- Remove 4 screws ⑫ from the CRT.
- Remove the CRT from the front cabinet.

Caution: Do not lift the CRT by the neck.

ADJUSTMENTS

MAIN PARTS LOCATION CHART

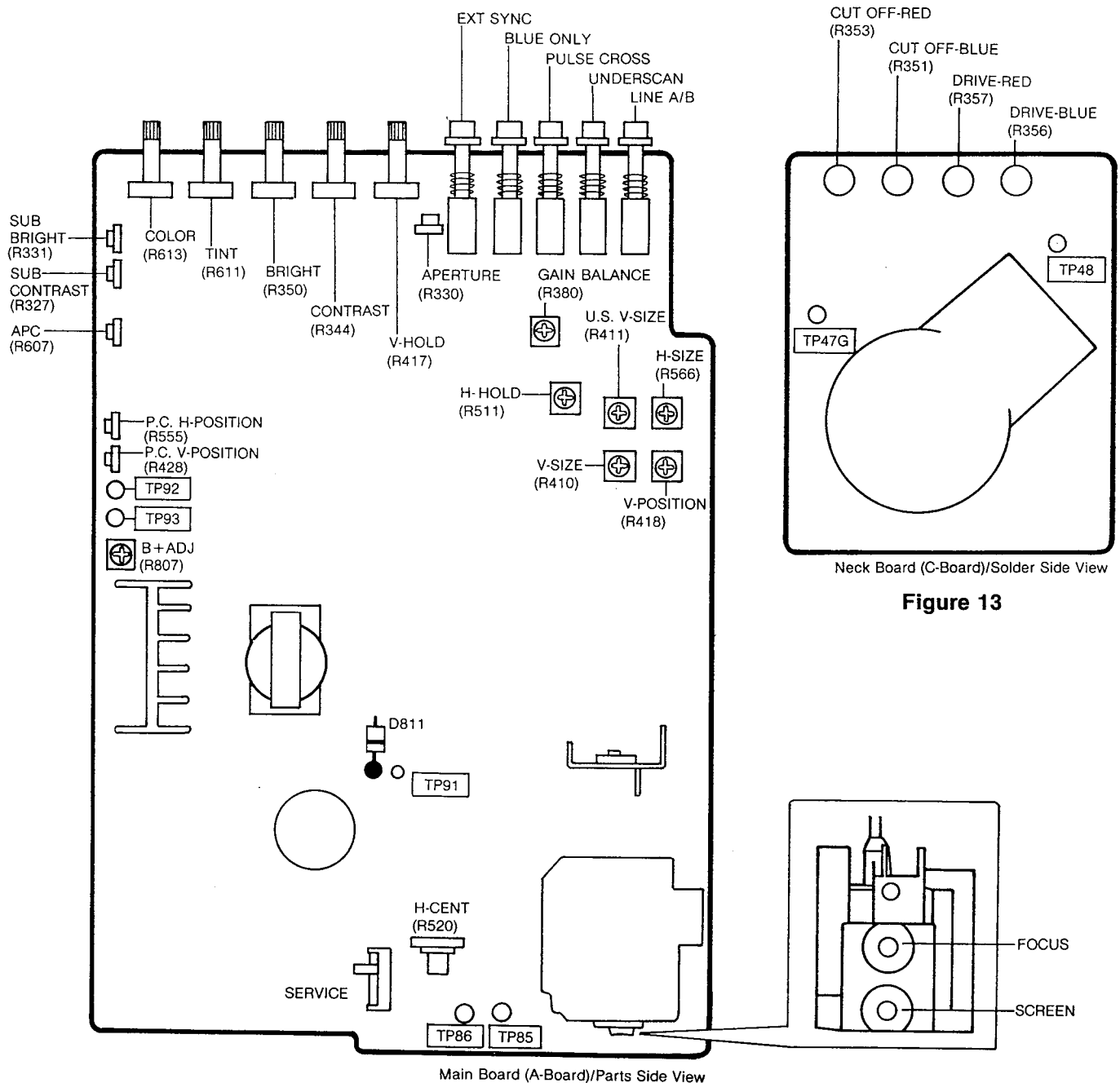


Figure 13

Figure 12

A. SERVICING ADJUSTMENTS

VERTICAL HOLD ADJUSTMENT

Adjust V-HOLD control (R417) and set it at the point where vertical movement (horizontal lines) stops.

APERTURE ADJUSTMENT

Adjust APERTURE control (R330) for proper sharpness control (R330).

FOCUS ADJUSTMENT

Adjust FOCUS control on the FBT to obtain the sharpest and clearest picture.

B. INTERNAL ADJUSTMENT

When measuring voltage with a VTVM, be sure to use the test points located on the conductor side of the circuit boards.

B+ VOLTAGE (+121 V) ADJUSTMENT

1. Set BRIGHT (R350) and CONTRAST (R344) controls to minimum and service switch to SERVICE position.
2. Connect a DC voltmeter between TP91 and chassis ground on main board (A-board).
3. Adjust B+ ADJ. control (R807) for $121.0V \pm 0.5V$.

HIGH VOLTAGE CONFIRMATION

1. Adjust white balance. (See page 12.)
2. Set BRIGHT (R350) and CONTRAST (R344) controls to minimum and service switch to SERVICE position.
3. Using a calibrated high voltage meter (electrostatic type) confirm that the high voltage is within the range of $22.0kV \pm 1.0kV$.

Note: Be certain that B+ voltage is $121.0V \pm 0.5V$ during the high voltage confirmation.

HORIZONTAL HOLD ADJUSTMENT

Adjust H-HOLD control (R511) and set it at the point where horizontal movement (diagonal lines) stops.

VERTICAL SIZE ADJUSTMENT

Adjust V-SIZE control (R410) until picture becomes symmetrical from top to bottom.

VERTICAL POSITION ADJUSTMENT

Adjust V-POSITION control (R418) until picture becomes vertical center.

H-RASTER CENTER ADJUSTMENT

Adjust H-CENTER control (R520) until picture becomes centered horizontally.

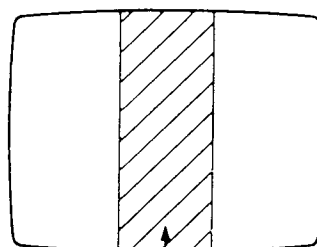
COLOR PURITY ADJUSTMENT

(See figures 14 and 16)

1. Operate the monitor for 20 minutes, with BRIGHT (R350) and CONTRAST (R344) controls at maximum position to warm up the CRT.
2. Degauss the monitor fully by using an external degaussing coil.
3. Roughly adjust convergence. (See page 12.)
4. Apply a black and white video signal.

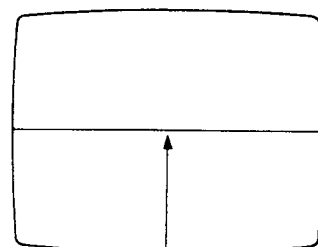
5. Turn RED and BLUE CUT OFF controls (R353 and R351) fully counterclockwise to obtain a green field. Adjust DRIVE controls (R357 and R356) if green field is not obtained.
6. Loosen the deflection yoke clamp screw and move the deflection yoke as close to the purity magnet as possible.
7. Release the purity magnets by cutting the white lacquer which locks the purity and convergence magnets. Then, adjust the purity magnet to set the vertical green raster precisely at the center of the screen. (See figure 14.)
8. Slowly move the deflection yoke forward and adjust for the best overall green screen.
9. Tighten the deflection yoke clamp screw.
10. Produce the blue and red raster with CUT OFF controls (R353 and R351) and observe that good purity is obtained on the respective field.
11. Observe that a uniform white raster is obtained by adjusting R and B CUT OFF controls (R353 and R351). If the screen is not uniformly white, repeat above procedure.

Note: Purity correction magnet may be effective to control purity slightly.



Green Raster

Figure 14



Horizontal Line

Figure 15

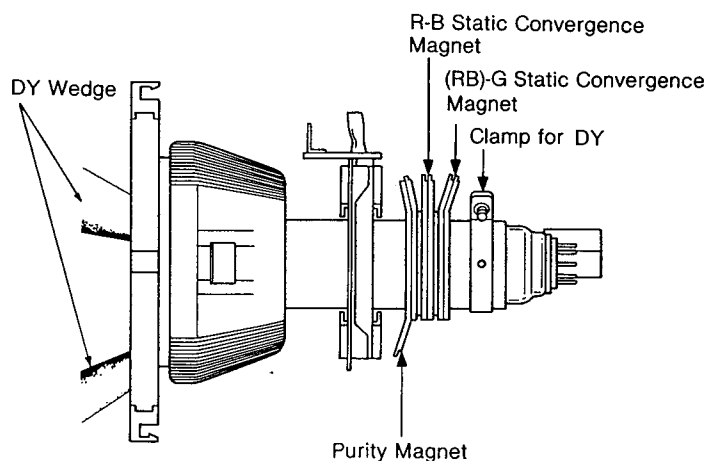


Figure 16

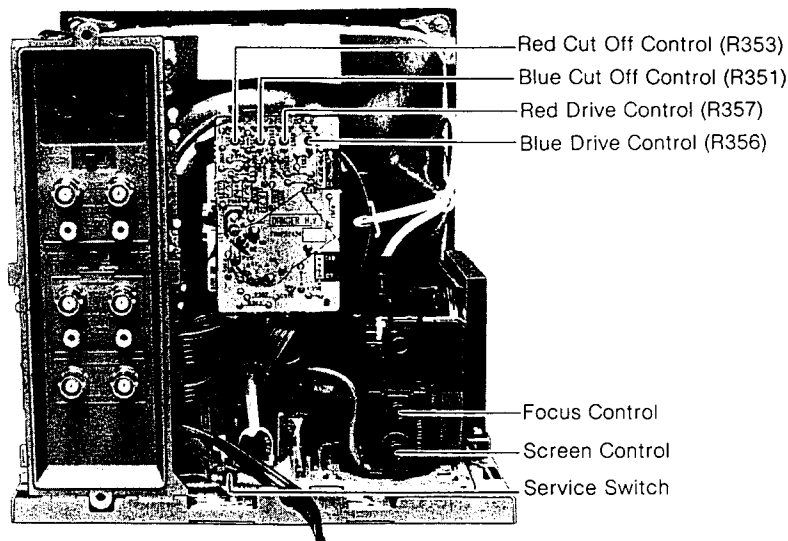


Figure 17

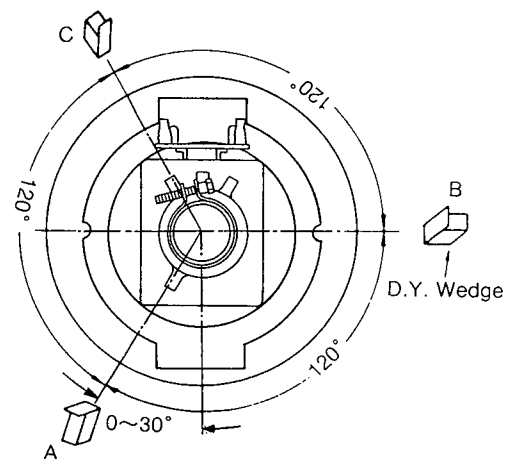


Figure 18

CONVERGENCE ADJUSTMENT

Note: Before adjusting convergence, vertical size and focus adjustments must be completed.

1. Apply a crosshatch signal.
2. The brightness level should be no higher than necessary to obtain a clear pattern.
3. Release the convergence magnet by cutting the white lacquer which locks the purity and convergence magnets. Then, converge the red and blue lines at the center of the screen by rotating the R-B static convergence magnet. (See figure 16.)
4. Align the converged red/blue lines with the green lines at the center of the screen by rotating the (RB)-G static convergence magnet. (See figure 16.)
5. Remove the DY wedges (see figure 16) and slightly tilt (do not rotate) the deflection yoke horizontally and vertically to obtain good overall convergence.
6. Secure the deflection yoke by reinserting the wedges. (See figure 18.)
7. If purity error is found, repeat the purity adjustments.
8. After the color purity and the convergence adjustments are completed, lock the magnets with white lacquer or silicone rubber.

Note:

1. Wedge A shown in figure 18 should be fixed within a range of $0^\circ \sim 30^\circ$ to the left of the vertical line as shown.
2. After inserting wedge A, insert wedges B and C. The wedges should be set 120° apart from each other.
3. Be certain that the three wedges are firmly fixed and the deflection yoke is tightly clamped in place. Otherwise the deflection yoke may shift its position and cause a loss of convergence and purity.

WHITE BALANCE ADJUSTMENT

(See figures 15 and 17.)

1. Apply a black and white video pattern.
2. Set TINT control (R611) to center and BRIGHT (R350), CONTRAST (R344) and COLOR (R613) controls to minimum position.
3. Set SERVICE switch to SERVICE position.
4. Turn two CUT OFF controls (R353 and R351) fully counterclockwise, then turn each control forward (clockwise) 90° .
5. Turn SCREEN control fully counterclockwise.
6. Connect a VTVM between TP47G and chassis ground on C-Board.
7. Adjust BRIGHT control (R350) so that the reading of VTVM becomes $105V \pm 1V$.
If BRIGHT control (R350) can not reach 105V, adjust SUB-BRIGHT control (R331) additionally.
8. Slowly turn SCREEN control clockwise until a dim green horizontal line appears on the picture tube screen.
9. Make the horizontal line white by turning two CUT OFF controls which were previously set in step (4).

10. Return SERVICE switch to FAST position.
11. Alternately adjust Red and Blue DRIVE controls (R357 and R356) to produce a normal black and white picture. Check the black and white picture detail for proper black and white retention (no coloration) from lowlights to highlights and at all brightness levels for proper tracking. Proper tracking at all brightness levels can be obtained when SCREEN control, CUT OFF controls, and DRIVE controls are properly adjusted. If the results are unsatisfactory, repeat all the above steps.

SUB-BRIGHT CONTROL ADJUSTMENT

This is factory adjusted. Usually no further adjustment is required in the field. However, when the A-board, C-board or CRT is replaced, the following adjustment is necessary:

1. Apply a cross hatch pattern signal.
2. Set BRIGHT (R350) and CONTRAST (R344) controls at their click position.
3. Connect the DC currentmeter between TP85 and TP86 (positive lead of the voltmeter to TP85 and negative lead to TP86).
4. Adjust SUB-BRIGHT control (R331) so that the reading of the currentmeter becomes approximately $170\mu\text{A}$ for proper picture brightness.

Note: For this adjustment NTSC Pattern Generator, model LCG-396 manufactured by Leader Electronics Corp. (Japan) is recommended.

UNDERSCAN V. SIZE ADJUSTMENT

1. Apply a monoscope pattern to the monitor.
2. Push UNDERSCAN switch on the front panel.
3. Adjust U.S. V-SIZE control (R411) until picture height becomes $4\text{mm} \pm 1\text{mm}$ shorter than picture tube screen at top and bottom as shown in figure 19.
4. If the picture is shifted upper or lower, adjust V-POSITION control (R418).

UNDERSCAN H. SIZE ADJUSTMENT

1. Apply a monoscope pattern to the monitor.
2. Push UNDERSCAN switch on the front panel.
3. Adjust H-SIZE control (R566) until picture width becomes $6\text{mm} \pm 1\text{mm}$ shorter than picture tube screen at both sides as shown in figure 19.
4. If the picture is shifted left or right, adjust H-CENTER control (R520).

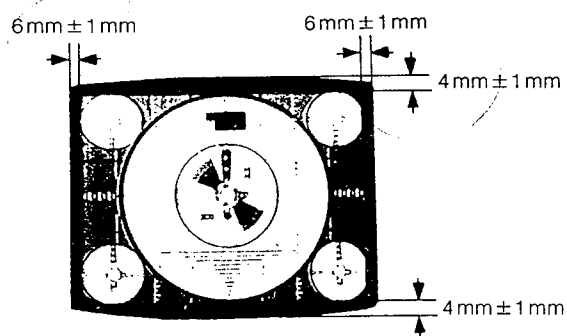


Figure 19

PULSE CROSS V-POSITION ADJUSTMENT

1. Apply a monoscope pattern to the monitor.
2. Push PULSE CROSS switch on the front panel.
3. Adjust P.C. V-POSITION control (R428) until horizontal blanking line becomes at the vertical center on picture tube screen. (See figure 20.)

PULSE CROSS H-POSITION ADJUSTMENT

1. Apply a monoscope pattern to the monitor.
2. Push PULSE CROSS switch on the front panel.
3. Adjust P.C. H-POSITION control (R555) until the length between left screen edge and vertical blanking line becomes approximately 35mm. (See figure 20.)

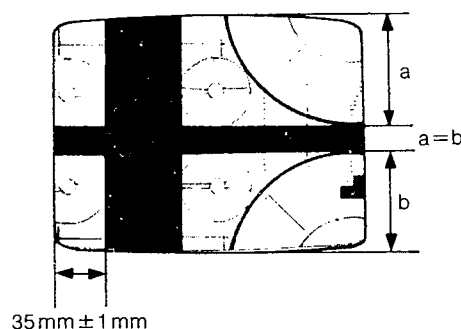


Figure 20

ALIGNMENTS

SUB-CONTRAST ALIGNMENT

1. Apply a studio color bar signal.
Input signal should be 1.0Vp-p.
(video level 0.7Vp-p, sync level 0.3Vp-p).
2. Set BRIGHT (R350) and CONTRAST (R344) controls fully clockwise.
3. Set COLOR control (R613) fully counterclockwise.
4. Connect an oscilloscope to TP48 on C-board.
5. Adjust SUB-CONTRAST control (R327) to obtain 1.5Vp-p ± 0.1 Vp-p from white level to black level.
(See figure 21.)

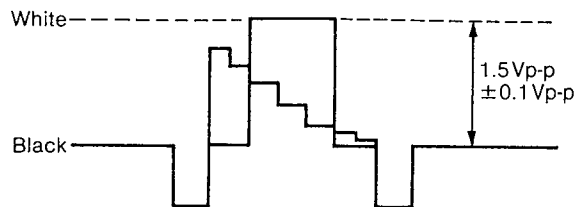


Figure 21

COMB FILTER ALIGNMENT

Preparation

1. Connect an oscilloscope to TP100.

Alignment Procedure

1. Apply a studio color bar signal.
2. Adjust GAIN BALANCE control (R380) to set 3.58MHz sub carrier to the minimum amplitude.
(See figure 22.)
3. Adjust the coil (L372) to set 3.58MHz sub carrier to the minimum amplitude.
4. Adjust GAIN BALANCE control (R380) to set 3.58MHz sub carrier to the minimum amplitude.

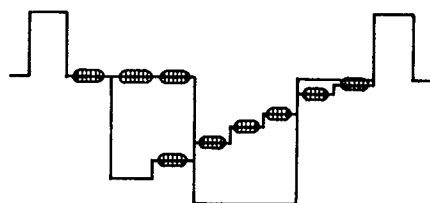
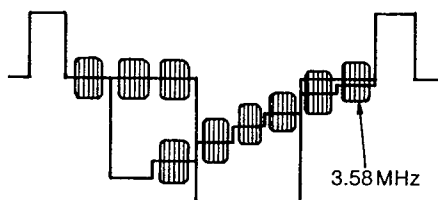


Figure 22

APC ALIGNMENT

Preparation

1. Prepare a C-jumper (0.33μF).
2. Connect a digital multi-meter between terminal ⑭ of IC601 and chassis ground.

Alignment Procedure

1. Apply a color video signal.
2. Measure the voltage of terminal ⑭ of IC601.
3. Connect the C-jumper between terminal ⑦ of IC601 and chassis ground.
4. Then apply a black and white video signal.
5. Adjust APC control (R607) so that the reading of the multi-meter becomes equal to the voltage measured at step 2.

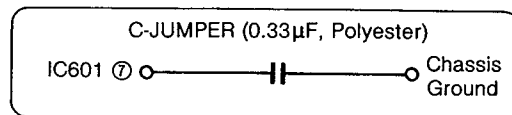
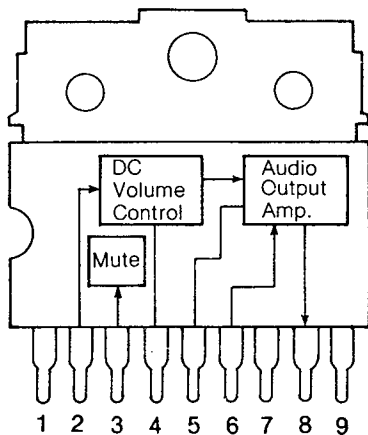


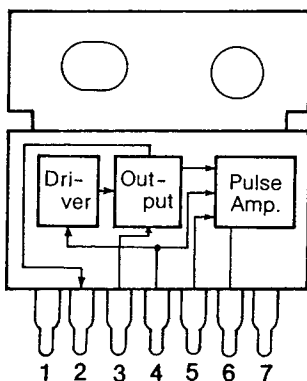
Figure 23

COMPONENT REFERENCE GUIDE



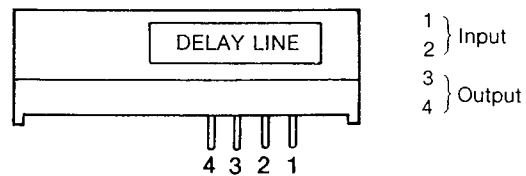
AN5265
(IC201)
Sound Output

Pin No.	Pin Name
1	Vcc 1
2	Sound Input
3	Mute
4	Volume Control
5	Filter
6	Feedback
7	GND
8	Sound Output
9	Vcc 2

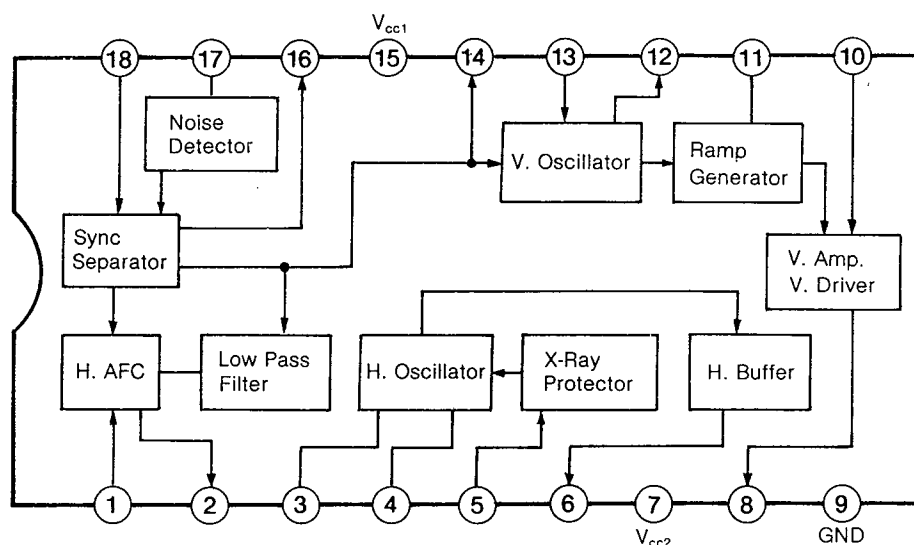
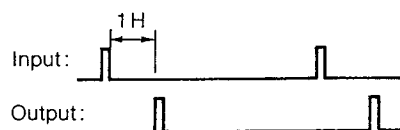


AN5515X
(IC402)
V. Deflection Output

Pin No.	Pin Name
1	GND
2	Output
3	Supply Voltage for Output
4	Input
5	Trigger Pulse Input
6	Pulse Amp. Output
7	Vcc

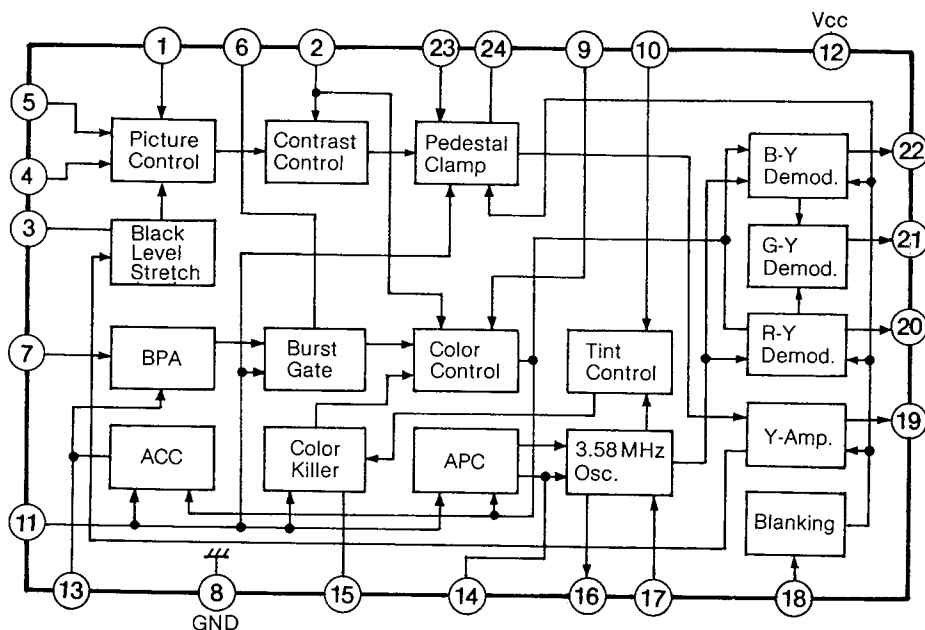


EFDMA645B95G
(L371)
Delay Line



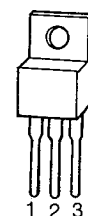
AN5436N
(IC401)
Deflection Signal Processing

Pin No.	Pin Name	Pin No.	Pin Name
1	AFC Ref. Signal Input	10	DC, AC Feedback Input
2	H. AFC Output	11	V. Sawtooth Capacitor
3	H. Hold Volume	12	V. Pulse Output
4	H. Osc. Capacitor	13	V. Hold Volume
5	X-Ray Protector Input	14	V. Integral Capacitor
6	H. Output	15	Vcc 1
7	Vcc 2	16	Sync Sep. Output
8	V. Output	17	Noise Detect Input
9	GND	18	Video Signal Input



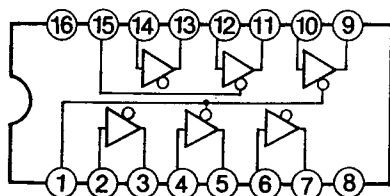
AN5316N
(IC601)
Video/Chrominance Signal Processing

Pin No.	Pin Name	Pin No.	Pin Name
1	Picture Control	13	ACC Filter
2	Contrast Control	14	APC Filter
3	Black Level Filter	15	Color Killer Filter
4	Video Input 1	16	3.58MHz Osc. Output
5	Video Input 2	17	3.58MHz Osc. Input
6	Chrominance By-pass	18	Blanking Pulse Input
7	Chrominance Input	19	Y Output
8	GND	20	(R-Y) Output
9	Color Control	21	(G-Y) Output
10	Tint Control	22	(B-Y) Output
11	Burst Gate Pulse Input	23	Brightness Control
12	Vcc	24	Pedestal Clamp Filter



1: Input
2: GND
3: Output

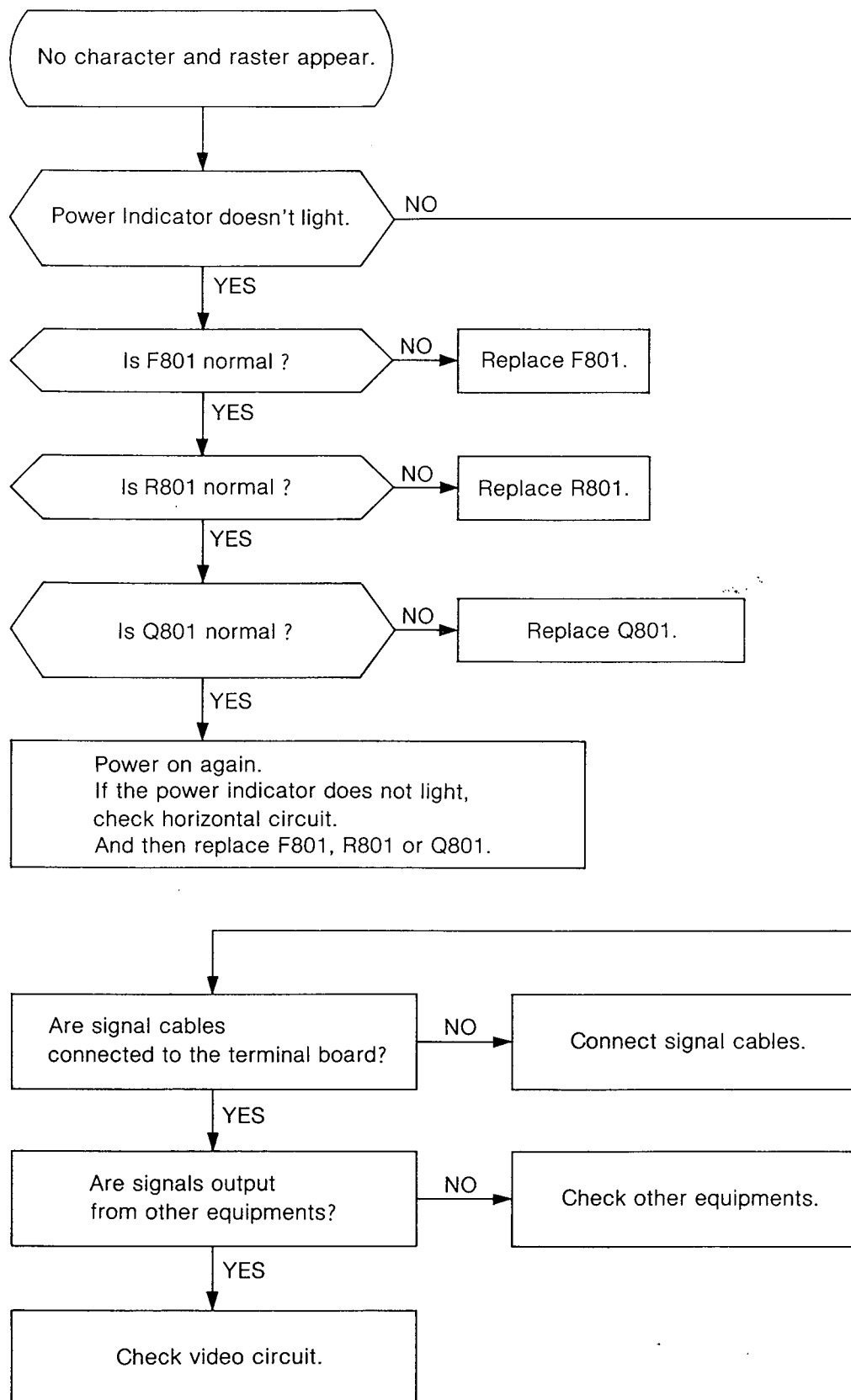
LA78M12
(IC502)
Regulator IC (+12V)

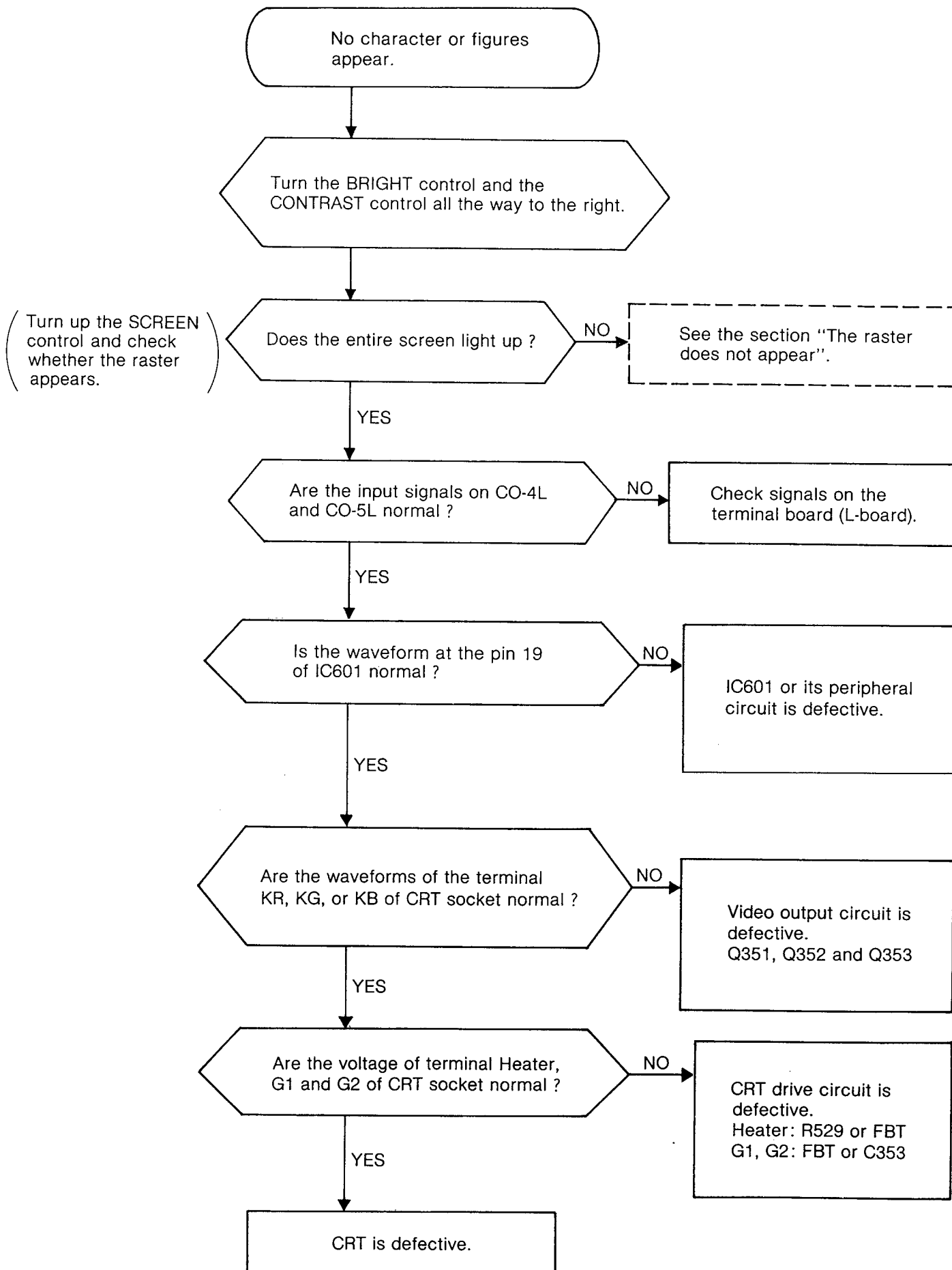


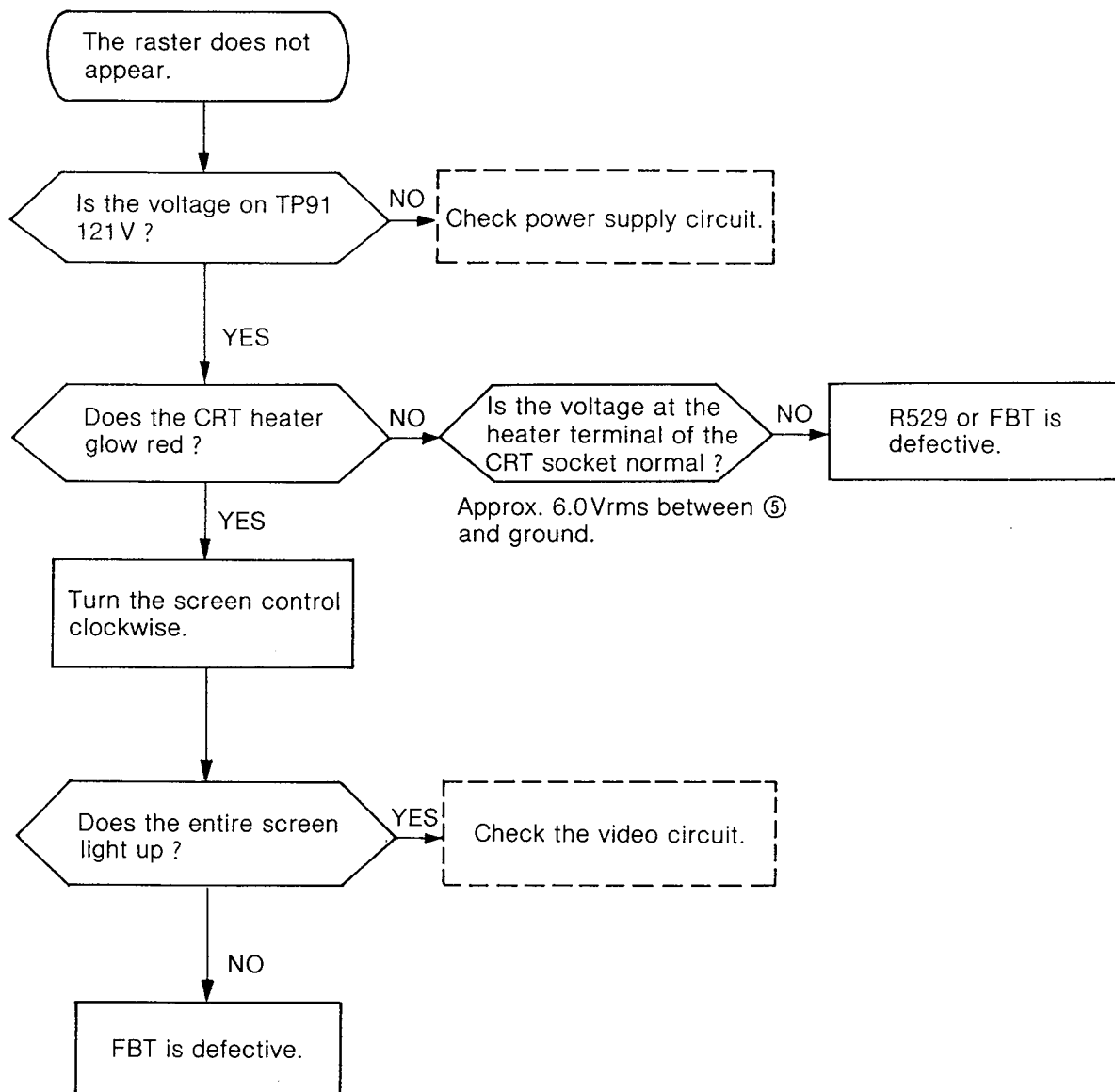
TVSUPD4503BC
(IC501)
3 State Driver

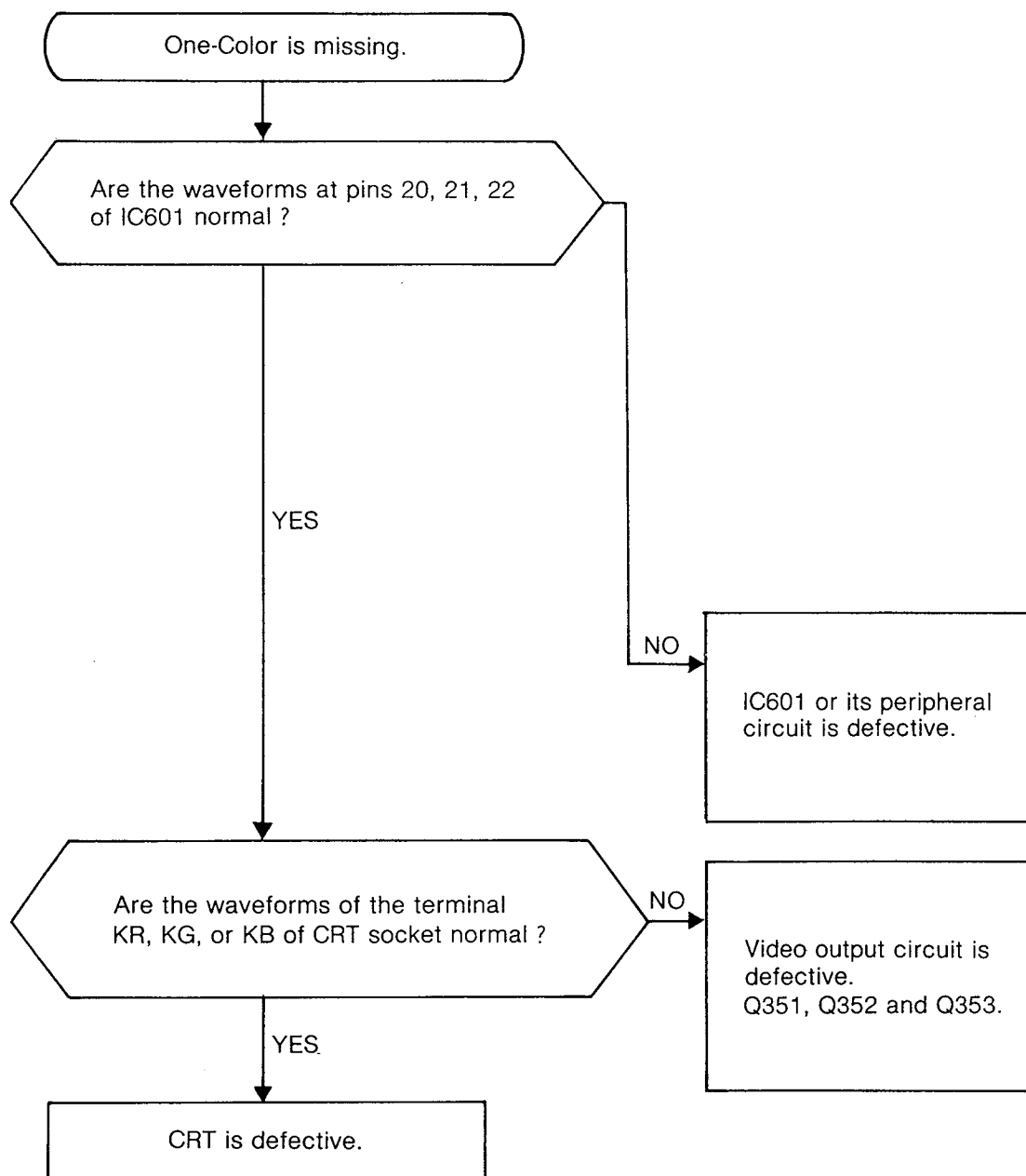
Pin No.	Pin Name
1	Output Control
2	1A
3	1Y
4	2A
5	2Y
6	3A
7	3Y
8	GND
9	4A
10	4Y
11	5A
12	5Y
13	6A
14	6Y
15	Output Control
16	Vcc

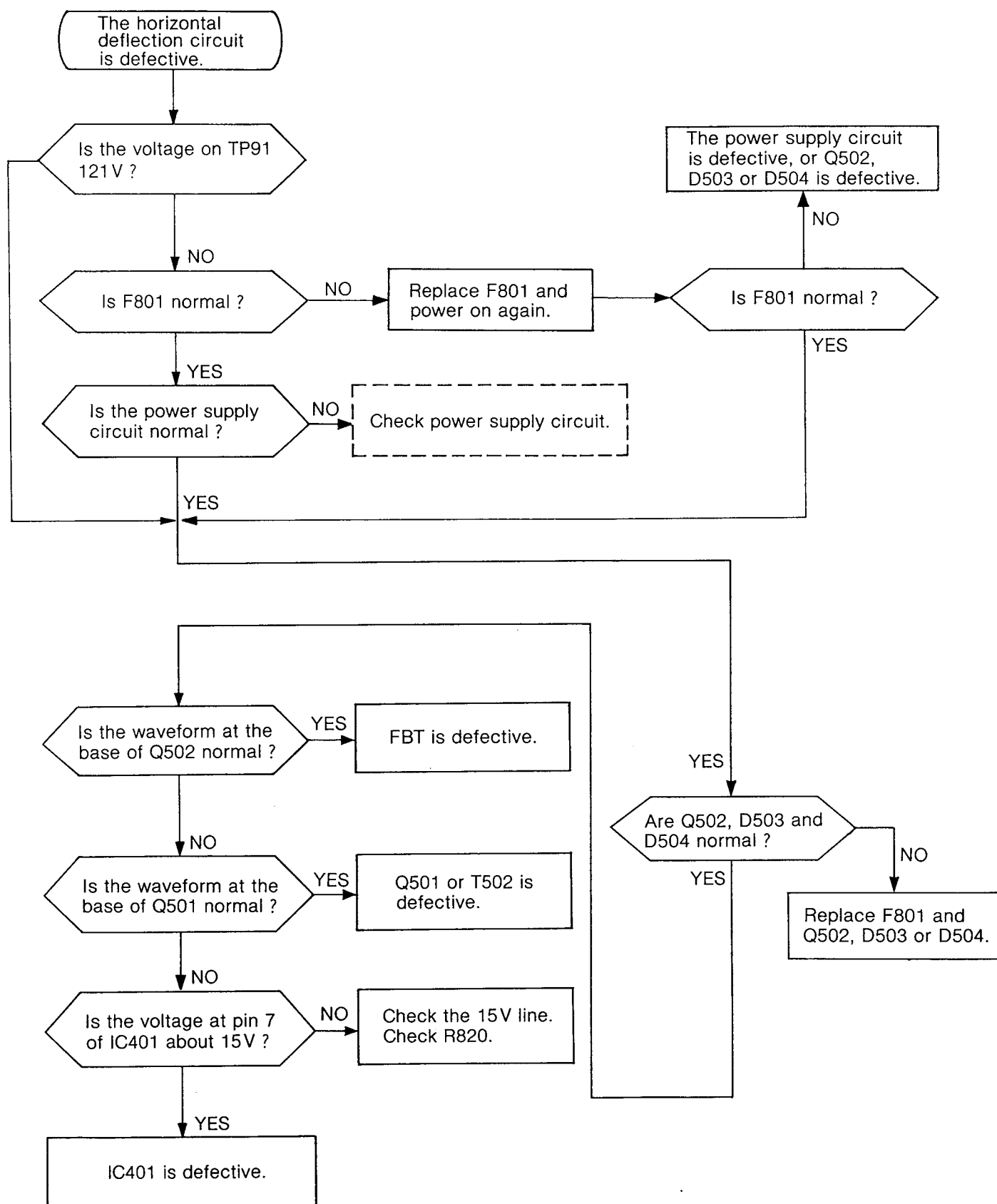
TROUBLESHOOTING FLOW CHART

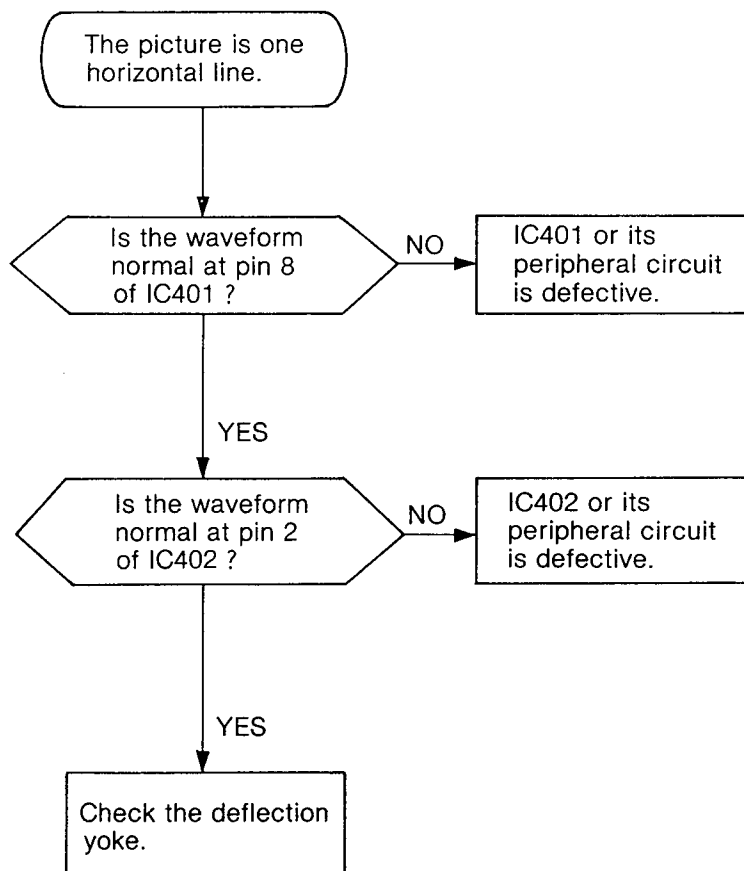
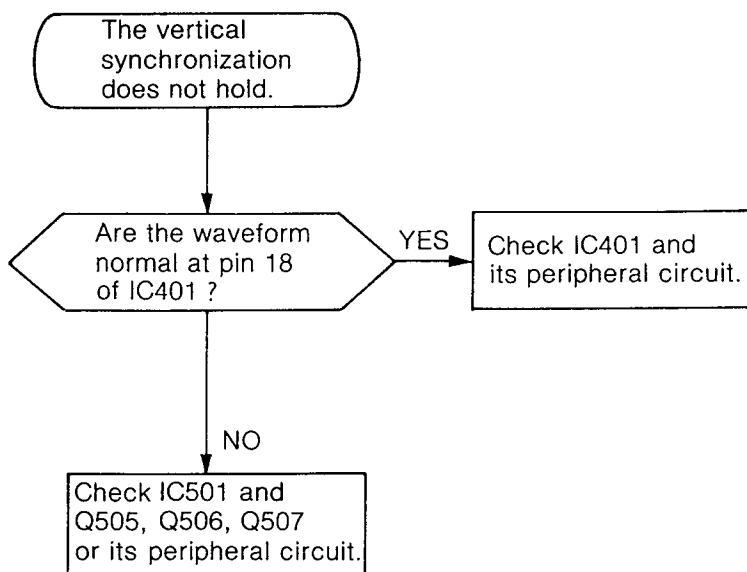












CLAMPING AND WIRING POSITIONS OF INTERNAL LEADS

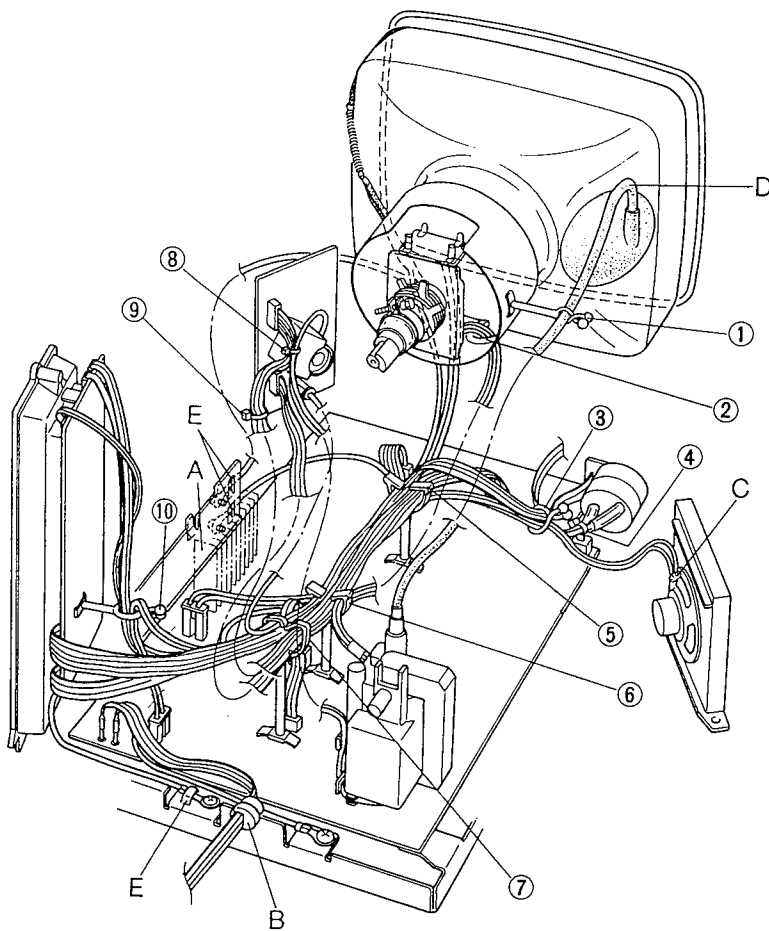


Figure 24

Caution:

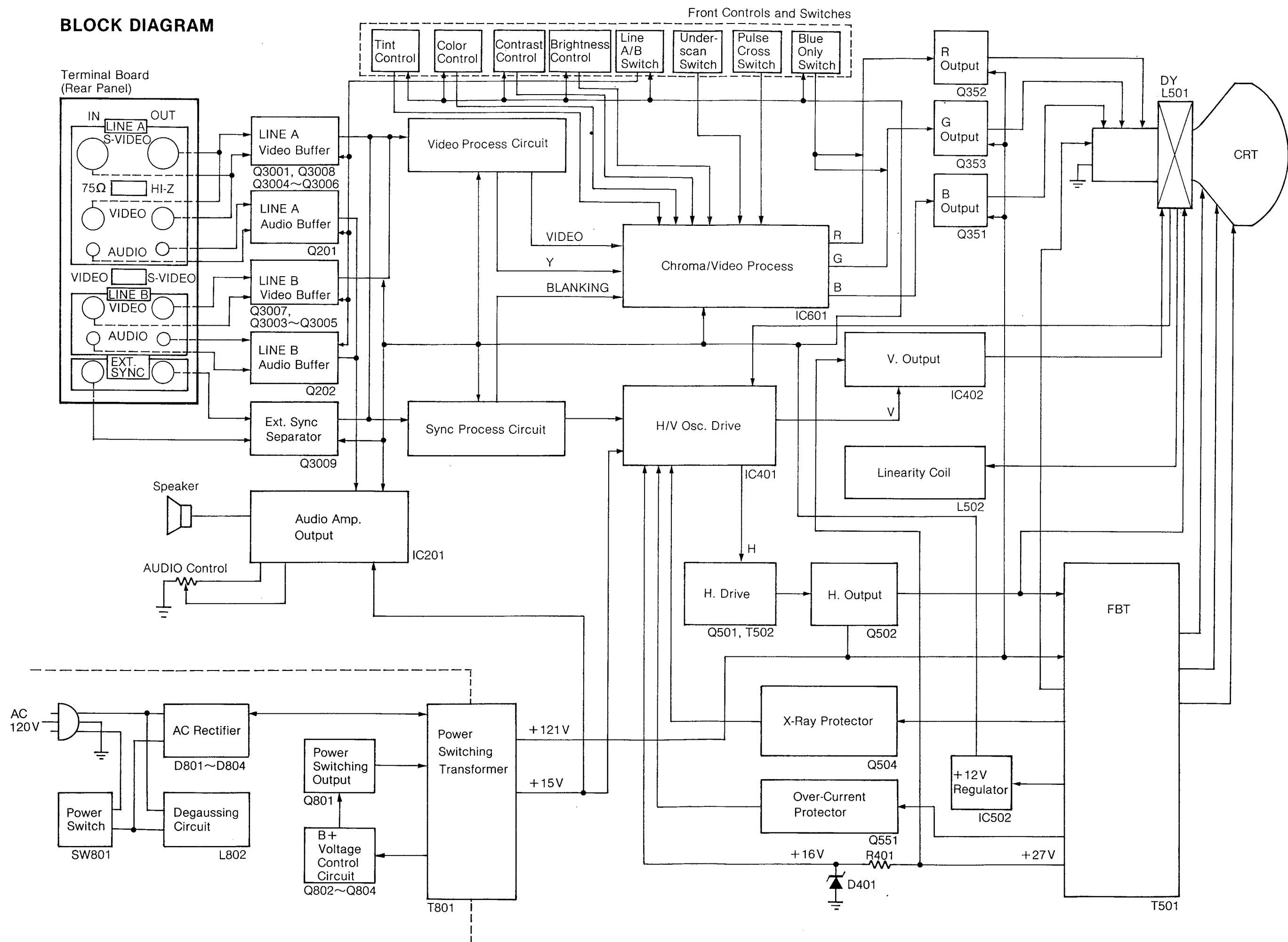
- A. Arrange all leads in order not to touch this heat sink.
- B. Fix the power cord bushing in order not to stretch the power cord.
- C. Fix the speaker to the speaker bracket so that the leads should be located in left upper side by seeing from the inside.
- D. Fit the anode cap so that the anode lead should be located in the upper part.
- E. Fix the leads by screws through these arches.

Clamper	Clamp Lead	Clamper	Clamp Lead
①	• A lead from the anode cap	⑦	• A cable from the speaker/CO-1L • A cable from A-Board/CO-3L • A cable from A-Board/CO-4L • A cable from A-Board/CO-5L • A cable from the power switch/CO-2L • A cable from A-Board/A1-A6 • Two leads from the Degaussing Coil • A 1P lead from Grounding Strap
②	• Four leads from DY		
③	• A cable from the speaker/CO-1L • Two leads from the power switch • A cable from the power switch/CO-2L • A cable from D-Board/CO-5A • A cable from A-Board/CO-4L		
④	• Two leads from the power switch		
⑤	• A cable from the speaker/CO-1L • A cable from A-Board/CO-4L • A cable from A-Board/CO-5L • Two leads from the power switch • A cable from the power switch/CO-2L • A cable from A-Board/A1-A6 • Two leads from the Degaussing Coil • A GND lead from A17 • A 1P lead from Grounding Strap/CO-1C	⑧	• Two leads from FBT • A cable from A-Board/A1-A6
		⑨	• A cable from A-Board/A1-A6
		⑩	• A cable from A-Board/CO-3L • A cable from the power switch/CO-2L • A cable from the speaker/CO-1L • Two leads from Degaussing Coil
⑥	• A cable from the speaker/CO-1L • A cable from A-Board/CO-4L • A cable from A-Board/CO-5L • Two leads from the power switch • A cable from the power switch/CO-2L • A cable from A-Board/A1-A6 • Two leads from the Degaussing Coil • A GND lead from A17 • A 1P lead from Grounding Strap/CO-1C • Four leads from DY		

MEMO

Handwriting practice area with horizontal dotted lines.

BLOCK DIAGRAM



SCHEMATIC DIAGRAM AND CIRCUIT BOARD

IMPORTANT SAFETY NOTICE

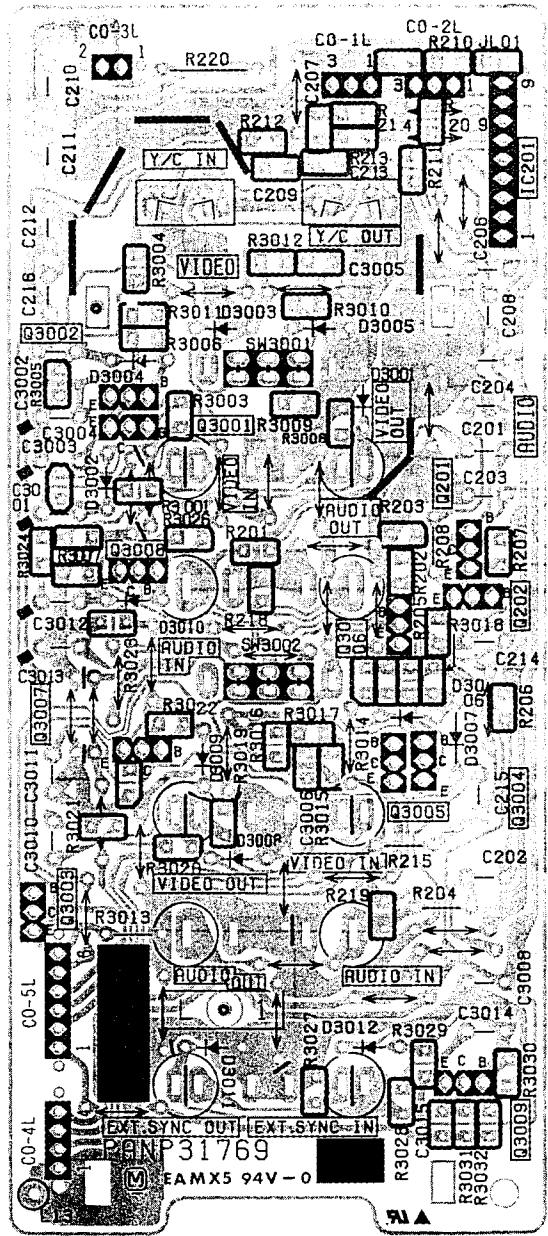
THE SHADED AREA ON THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X—RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURER'S SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE SHADED AREAS OF THE SCHEMATIC.

NOTE:

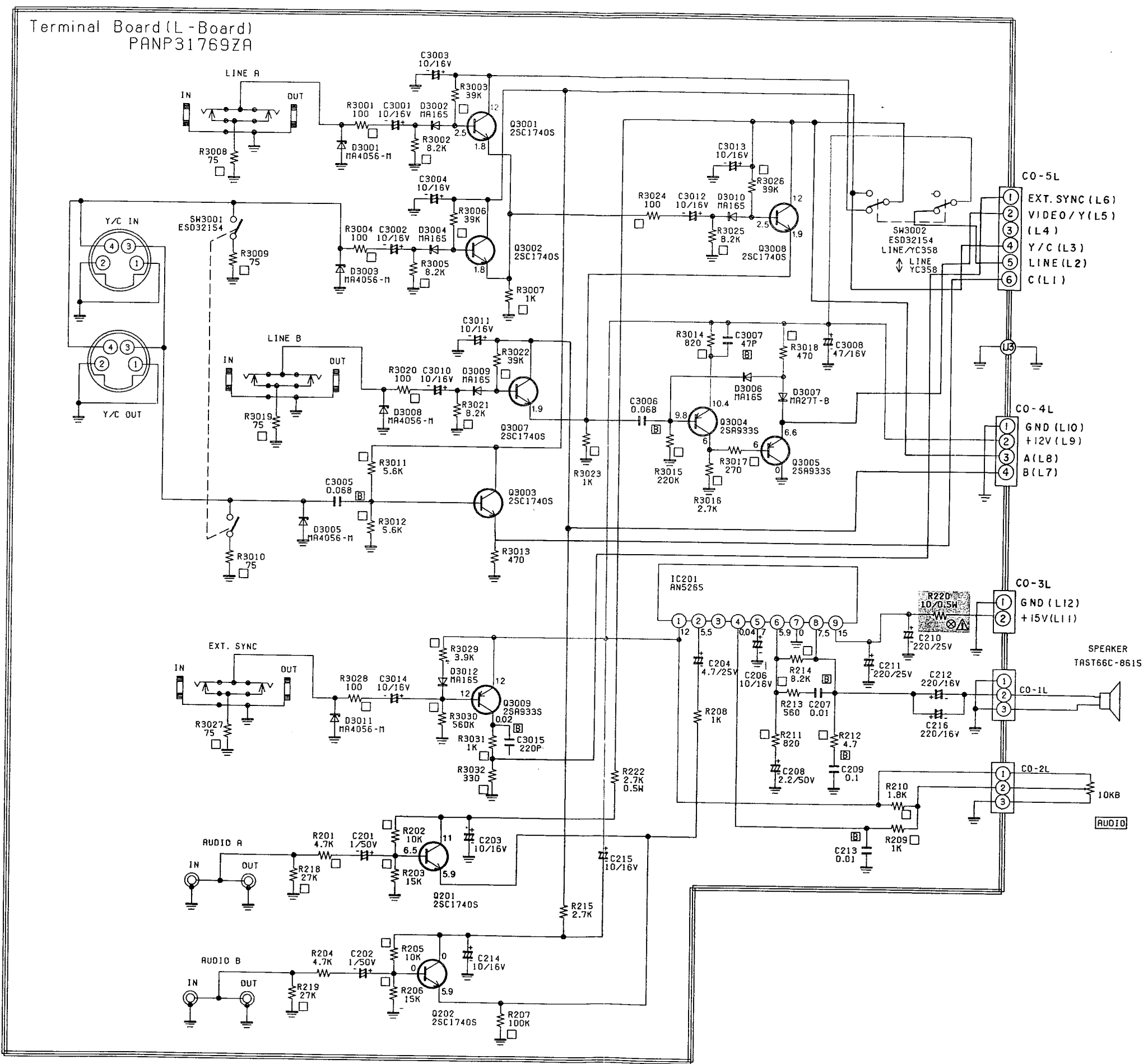
1. All resistors are carbon 1/4W resistor, unless otherwise noted with the following marks.
Unit of resistance is OHM (Ω), (K = 1,000, M = 1,000,000).
 Δ : Solid \sim : Thermistor \textcircled{L} : Leadless Type
 \square : Chip (1/8W) \otimes : Fuse
 \circ : Non-flammable \boxtimes : Metal Oxide
 \boxplus : Cement \odot : Metal Film
2. CAPACITOR
All capacitors are ceramic 50V capacitor, unless otherwise noted with the following marks.
Unit of capacitance is μ F, unless otherwise noted.
 H : Electrolytic NH : NH Type S : Polystyrene \square : Chip (SL)
 NP : Bipolar O : Titanium Oxide \boxtimes : Polypropylene B : Chip (not SL)
 Z : Z Type \otimes : Temp Compensation M : Metalized Polyester
 T : Tantalum P : Polyester
3. COIL
Unit of inductance is μ H.
4. TEST POINT
: Test point position.
5. VOLTAGE MEASUREMENT
Voltage is measured by a volt ohm meter with DC 20k OHM/V receiving a rainbow color bar signal when all customer's controls are set to the maximum position.
6. When arrow mark (\nearrow) is found, connection is easily found along with the direction of an arrow.
7. This schematic diagram is the latest at the time of printing and subject to change without notice.

 MA150 MA165 MA167 MA171 MA27W-A MA27T-A MA27T-B MA1068-L MA4056-M TVSRD5.1ESB2 TVSRD9.1ESB2 TVSRD12EBM TVSRD16EB1 TVSRD24EB1	 TVSEM-1Z ES01F TVSRGP10J IN4003 ERB44-08 P6KE130A AU01Z TVSES-1 EM2B TVSES-1Z	 R2KN-1	 2SC3872-LS	 2SD1439-Q
 2SD889-R 2SB774-R 2SC1473-QRNC 2SD965-R	 2SA933S 2SC1740S	 2SC1383-NC 2SC1473AH	 2SA885-R	 L78M12
 2SD1266				
 AN5515X	 AN5265	 AN5436N (18 Pin) TVSUPD4503BC (16 Pin)	 AN5316N (24 Pin) AN5332N (22 Pin)	

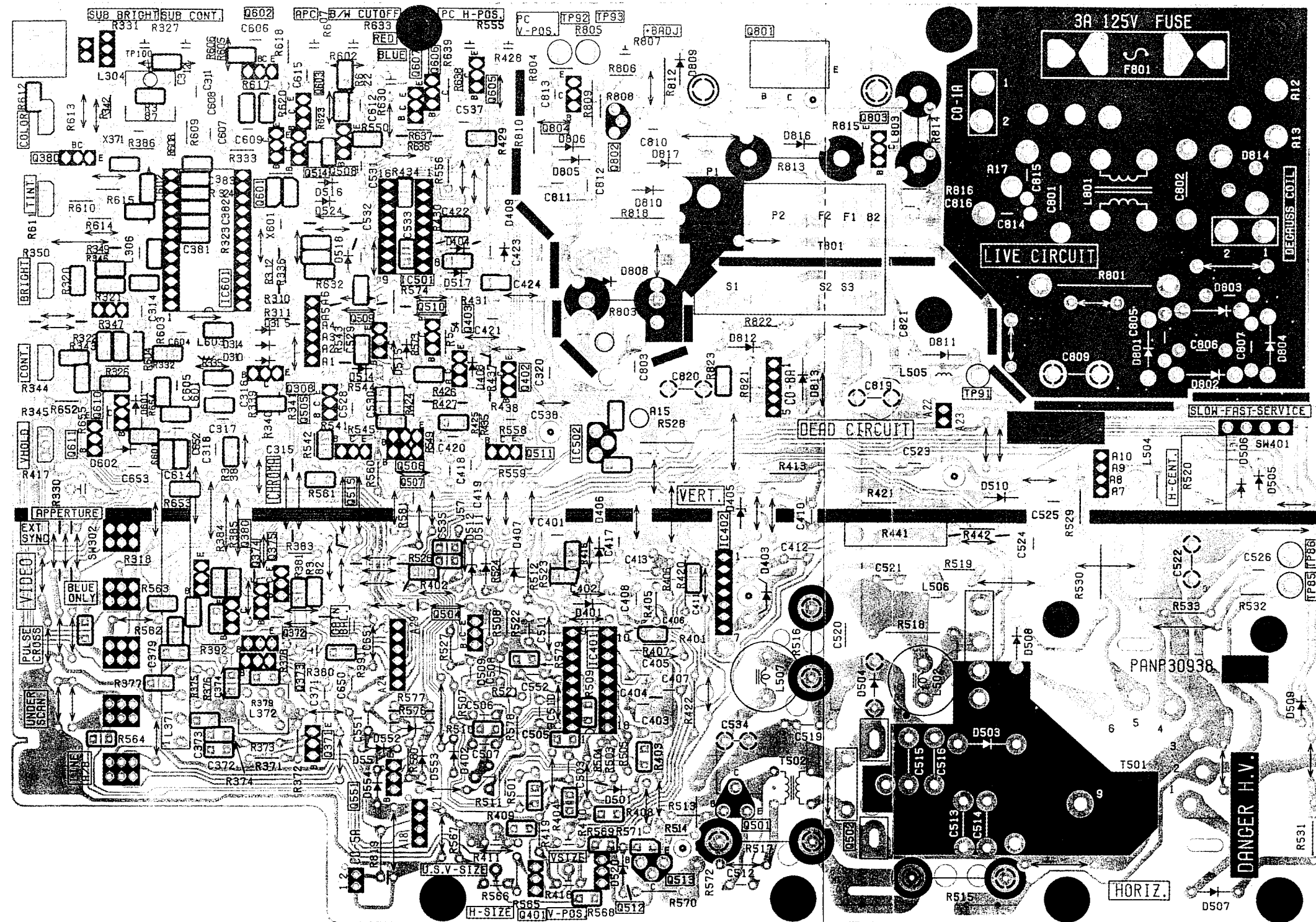
Terminal Board (L-Board)



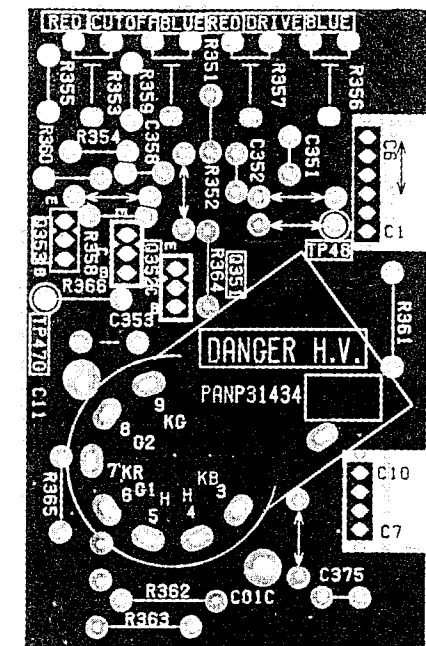
PANP31769ZA/Solder Side View



Main Board (A-Board)

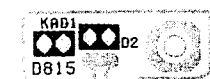


Neck Board (C-Board)



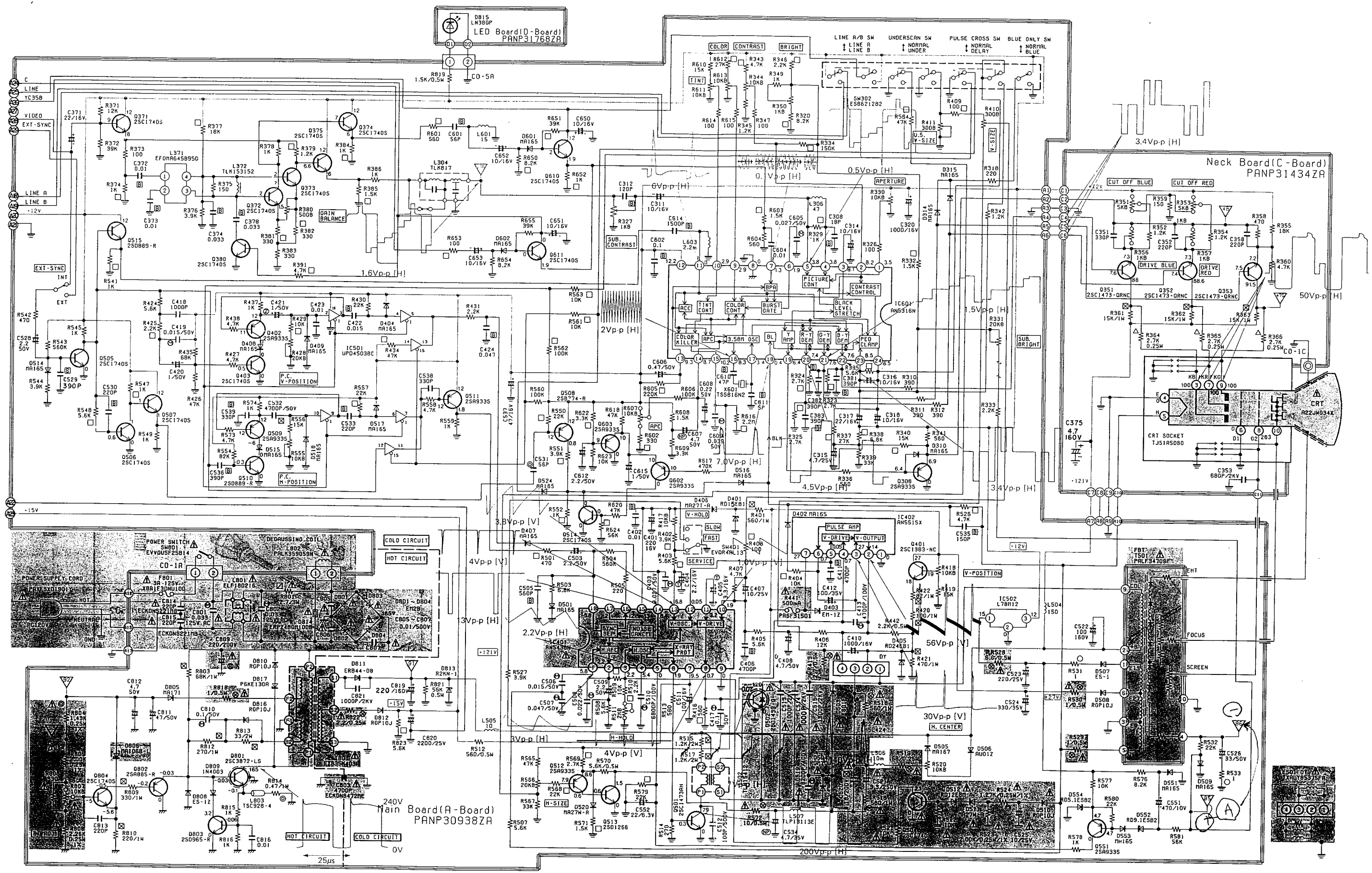
PANP31434ZA/Solder Side View

LED Board (C-Board)



PANP31768ZA/
Solder Side View

PANP30938ZA/Solder Side View



REPLACEMENT PARTS LIST

Important Safety Notice

Components identified by shaded area have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

Warning

After servicing R577 (H.V. ADJUST), cover the ocntrl volume with UL tube and fill up silicon rubber in it so as the volume is not turned.

RESISTOR

PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
C	Carbon	F	± 1%
F	Fuse	J	± 5%
M	Metal Oxide	K	± 10%
S	Solid	M	± 20%
W	Wire Wound	G	± 2%

Part No.

Description

Example: ERD25TJ104

C

100K

J

1/4W

CAPACITOR

PART NAME & DESCRIPTION			
TYPE		ALLOWANCE	
C	Ceramic	C	± 0.25pF
E	Electrolytic	D	± 0.5pF
P	Polyester	F	± 1pF
S	Styrol	J	± 5%
T	Tantalum	K	± 10%
PP	Polypropylene	L	± 15%
		M	± 20%
		P	+100% -0%
		Z	+80% -20%

Part No.

Description

Example: ECKF1H103ZF

C

0.01μF

Z

50V

Mechanical Parts

No.	Part No.	Description
MECHANICAL PARTS		
M 1	A22JWG34X	CRT
M 2	TAST66C-8615	Speaker
M 3	TXALY85375FA	DY
M 4	EVVVGU5F25B14	Power Switch 10KohmB
M 5	PAKA3504	Top Cabinet
M 6	PAYK1S901Y	Back Cover Complete
M 7	TKK139208-1	Handle
M 8	PAKK358201	Handle Cover
M 9	PAKE3505A01	Front Cabinet Complete
M 10	TBX1353500	Power/Volume Knob
M 11	PAKP3510060	Front Control Panel
M 12	PAUX37901	PowerSwitch Metal Bracket
M 13	PAUW35904	Top Cabinet Fix Metal
M 14	PAUK359059N	Degaussing Coil
M 15	PAXF3A01901Y	CRT Grounding Strap
M 16	PAMX35902	DY Shield Case Bracket
M 17	TUC24557	DY Shield Case
M 18	PAJB356002	Terminal Board Holder
M 19	TBX2783100	Front Control Knob
M 20	TMX13935-1	Speaker Bracket
M 21	PAXFSX01901Y	Power Supply Cord
M 22	TMM14416	Power Cord Bushing
M 23	PAKS35301	Base Frame
M 24	TBL173302	Foot
M 25	PABM375013	Name Plate
M 26	PANP30938ZA	A-Board Complete
M 27	PANP31769ZA	L-Board Complete
M 28	PANP31434ZA	C-Board Complete

No.	Part No.	Description
M 29	PANP31768ZA	D-Board Complete
M 30	PAXAJE01901Y	1P GND Lead
M 31	PAXAJT13901Y	Speaker Lead/CO-1L
M 32	PAXAJT03901Y	Power Switch Lead/CO-1A
M 33	PAXAJT02901Y	Volume Lead/CO-2L
M 34	TMM17538	DY Wedge
U 1	TMM6463	Clamper
U 2	TMM16452	Clamper
U 3	TMM5439	Clamper
U 4	TMM15412-1	Clamper
U 5	TMM13497	Clamper
U 6	TMM6434	C Bushing
U 7	TMM17498	Plastic Wire Tie
B 1	XTB4+15AFZ	Screw/Handle
B 2	XTW3+6LFZ	Screw/Back Cover
B 3	XTB4+15AFZ	Screw/Term. Board Holder
B 4	XTW3+6LFZ	Screw/Top Cabinet
B 5	THE415-2	Screw/CRT
B 6	XTV3+12G	Screw/Power SW Fix Metal
B 7	THW40807-9	Washer/Power Switch
B 8	THN1948-2	Nut/Power Switch
B 9	XTW3+6L	Screw/D-Board
B 10	XTN3+6FZ	Screw/Base Frame
B 11	XTW3+6L	Screw/A-Board
B 12	XYA4+EF8	Screw/Power Cord GND Lead
B 13	XTW3+6L	Screw/1P GND Lead
B 14	XTW3+6L	Screw/Speaker Bracket

BT-S901Y

Main Board (A-Board)

No.	Part No.	Description
RESISTORS		
R 310	ERDS2TJ391	C 390ohm, J, 1/4W
R 311	ERDS2TJ391	C 390ohm, J, 1/4W
R 312	ERDS2TJ391	C 390ohm, J, 1/4W
R 318	ERDS2TJ221	C 220ohm, J, 1/4W
R 320	ERJ8GEYJ822	C 8.2Kohm, J, 1/8W
R 323	ERJ8GEYJ272	C 2.7Kohm, J, 1/8W
R 324	ERJ8GEYJ272	C 2.7Kohm, J, 1/8W
R 325	ERJ8GEYJ272	C 2.7Kohm, J, 1/8W
R 326	ERDS2TJ101	C 100ohm, J, 1/4W
R 327	EVND2AA03B13	Sub. Contrast 1KohmB
R 329	ERJ8GEYJ102	C 1Kohm, J, 1/8W
R 330	EVND2AA03B14	Aperture 10KohmB
R 331	EVND2AA03B24	Sub. Bright 20KohmB
R 332	ERJ8GEYJ152	C 1.5Kohm, J, 1/8W
R 333	ERDS2TJ222	C 2.2Kohm, J, 1/4W
R 334	ERJ8GEYJ154	C 150Kohm, J, 1/8W
R 335	ERJ8GEYJ562	C 5.6Kohm, J, 1/8W
R 336	ERDS2TJ561	C 560ohm, J, 1/4W
R 337	ERJ8GEYJ273	C 27Kohm, J, 1/8W
R 338	ERJ8GEYJ682	C 6.8Kohm, J, 1/8W
R 339	ERDS2TJ333	C 33Kohm, J, 1/4W
R 340	ERJ8GEYJ153	C 15Kohm, J, 1/8W
R 341	ERDS2TJ561	C 560ohm, J, 1/4W
R 342	ERDS2TJ122	C 1.2Kohm, J, 1/4W
R 343	ERJ8GEYJ472	C 4.7Kohm, J, 1/8W
R 344	EVUE30E25B14	Contrast 10KohmB
R 345	ERDS2TJ122	C 1.2Kohm, J, 1/4W
R 346	ERJ8GEYJ222	C 2.2Kohm, J, 1/8W
R 347	ERDS2TJ101	C 100ohm, J, 1/4W
R 349	ERDS2TJ102	C 1Kohm, J, 1/4W
R 350	EVUE30E25B13	Bright 1KohmB
R 371	ERDS2TJ123	C 12Kohm, J, 1/4W
R 372	ERDS2TJ393	C 39Kohm, J, 1/4W
R 373	ERDS2TJ101	C 100ohm, J, 1/4W
R 374	ERJ8GEYJ102	C 1Kohm, J, 1/8W
R 375	ERDS2TJ151	C 150ohm, J, 1/4W
R 376	ERDS2TJ392	C 3.9Kohm, J, 1/4W
R 377	ERJ8GEYJ183	C 18Kohm, J, 1/8W
R 378	ERDS2TJ102	C 1Kohm, J, 1/4W
R 379	ERJ8GEYJ122	C 1.2Kohm, J, 1/8W
R 380	EVND8AA00B52	Gain Balance 500ohmB
R 381	ERJ8GEYJ331	C 330ohm, J, 1/8W
R 382	ERJ8GEYJ331	C 330ohm, J, 1/8W
R 383	ERDS2TJ331	C 330ohm, J, 1/4W
R 384	ERJ8GEYJ102	C 1Kohm, J, 1/8W
R 385	ERJ8GEYJ152	C 1.5Kohm, J, 1/8W
R 386	ERDS2TJ102	C 1Kohm, J, 1/4W
R 391	ERJ8GEYJ472	C 4.7Kohm, J, 1/8W
R 401	ERG1SJ561P	M 560ohm, J, 1W
R 402	ERJ8GEYJ392	C 3.9Kohm, J, 1/8W
R 403	ERJ8GEYJ562	C 5.6Kohm, J, 1/8W

No.	Part No.	Description
R 404	ERJ8GEYJ103	C 10Kohm, J, 1/8W
R 405	ERDS2TJ562	C 5.6Kohm, J, 1/4W
R 406	ERDS2TJ123	C 12Kohm, J, 1/4W
R 407	ERDS2TJ472	C 4.7Kohm, J, 1/4W
R 408	ERJ8GEYJ101	C 100ohm, J, 1/8W
R 409	ERJ8GEYJ101	C 100ohm, J, 1/8W
R 410	EVND8AA00B32	V-Size 300ohmB
R 411	EVND8AA00B32	U.S. V-Size 300ohmB
R 413	ERQ12AJ2R7P	F 2.7ohm, J, 1/2W
R 416	ERJ8GEYJ561	C 560ohm, J, 1/8W
R 417	EVUE20E25B14	V-Hold 10KohmB
R 418	EVND8AA00B14	V. Position 10KohmB
R 419	ERDS2TJ153	C 15Kohm, J, 1/4W
R 420	ERG1SJ101P	M 100ohm, J, 1W
R 421	ERG1ANJ471H	M 470ohm, J, 1W
R 422	ERG1SJ820P	M 82ohm, J, 1W
R 424	ERDS2TJ562	C 5.6Kohm, J, 1/4W
R 425	ERJ8GEYJ222	C 2.2Kohm, J, 1/8W
R 426	ERDS2TJ473	C 47Kohm, J, 1/4W
R 427	ERDS2TJ472	C 4.7Kohm, J, 1/4W
R 428	EVND2AA03B24	P.C.V-Position 20KohmB
R 429	ERJ8GEYJ103	C 10Kohm, J, 1/8W
R 430	ERDS2TJ223	C 22Kohm, J, 1/4W
R 431	ERDS2TJ222	C 2.2Kohm, J, 1/4W
R 434	ERJ8GEYJ473	C 47Kohm, J, 1/8W
R 435	ERDS2TJ683	C 68Kohm, J, 1/4W
R 437	ERDS2TJ102	C 1Kohm, J, 1/4W
R 438	ERDS2TJ472	C 4.7Kohm, J, 1/4W
R 441	PASF31501	Fuse 500mA
R 442	ERDS1TJ222	C 2.2Kohm, J, 1/2W
R 501	ERJ8GEYJ471	C 470ohm, J, 1/8W
R 503	ERDS2TJ682	C 6.8Kohm, J, 1/4W
R 504	ERDS2TJ564	C 560Kohm, J, 1/4W
R 505	ERDS2TJ221	C 220ohm, J, 1/4W
R 507	ERDS2TJ562	C 5.6Kohm, J, 1/4W
R 508	ERDS2TJ562	C 5.6Kohm, J, 1/4W
R 509	ERJ8GEYJ103	C 10Kohm, J, 1/8W
R 510	ERJ8GEYJ222	C 2.2Kohm, J, 1/8W
R 511	EVND8AA00B23	H-Hold 2KohmB
R 512	ERDS1TJ561	C 560ohm, J, 1/2W
R 513	ERDS2TJ561	C 560ohm, J, 1/4W
R 514	ERDS2TJ271	C 270ohm, J, 1/4W
R 515	ERG2ANJ122H	M 1.2Kohm, J, 2W
R 516	ERQ1AJ561S	F 560ohm, J, 1W
R 517	ERG2ANJ122H	M 1.2Kohm, J, 2W
R 518	ERQ1AJ561S	F 560ohm, J, 1W
R 519	ERQ14AJ680P	F 68ohm, J, 1/4W
R 520	EVNJ6U10KB14	H. Center 10KohmB
R 521	ERDS2TJ103	C 10Kohm, J, 1/4W
R 522	ERDS2TJ103	C 10Kohm, J, 1/4W
R 523	EROS2CKF2001	M 2.00Kohm, F, 1/4W
R 524	EROS2CKF1271	M 1.27Kohm, F, 1/4W
R 526	ERJ8GEYJ472	C 4.7Kohm, J, 1/8W

No.	Part No.	Description
R 527	ERDS2TJ392	C 3.9Kohm, J, 1/4W
R 528	ERQ12HJ6R8P	F 6.8ohm, J, 1/2W
R 529	ERQ12AZJ1R0P	F 1ohm, J, 1/2W
R 530	ERQ12HJ1R0P	F 1ohm, J, 1/2W
R 531	ERD25FJ1R0P	C 1ohm, J, 1/4W
R 532	ERDS2TJ223	C 22Kohm, J, 1/4W
R 533	ERD25FJ1R0P	C 1ohm, J, 1/4W
R 541	ERJ8GEYJ102	C 1Kohm, J, 1/8W
R 542	ERDS2TJ471	C 470ohm, J, 1/4W
R 543	ERDS2TJ564	C 560Kohm, J, 1/4W
R 544	ERDS2TJ392	C 3.9Kohm, J, 1/4W
R 545	ERDS2TJ102	C 1Kohm, J, 1/4W
R 547	ERJ8GEYJ102	C 1Kohm, J, 1/8W
R 548	ERJ8GEYJ562	C 5.6Kohm, J, 1/8W
R 549	ERDS2TJ102	C 1Kohm, J, 1/4W
R 550	ERJ8GEYJ223	C 22Kohm, J, 1/8W
R 551	ERJ8GEYJ392	C 3.9Kohm, J, 1/8W
R 552	ERJ8GEYJ102	C 1Kohm, J, 1/8W
R 554	ERDS2TJ823	C 82Kohm, J, 1/4W
R 555	EVND2AA03B14	P.C.H-Position 10KohmB
R 556	ERDS2TJ153	C 15Kohm, J, 1/4W
R 557	ERJ8GEYJ223	C 22Kohm, J, 1/8W
R 558	ERDS2TJ472	C 4.7Kohm, J, 1/4W
R 559	ERDS2TJ102	C 1Kohm, J, 1/4W
R 560	ERDS2TJ104	C 100Kohm, J, 1/4W
R 561	ERJ8GEYJ103	C 10Kohm, J, 1/8W
R 562	ERJ8GEYJ104	C 100Kohm, J, 1/8W
R 563	ERJ8GEYJ103	C 10Kohm, J, 1/8W
R 564	ERJ8GEYJ473	C 47Kohm, J, 1/8W
R 565	ERDS2TJ473	C 47Kohm, J, 1/4W
R 566	EVND8AA00B24	H-Size 20KohmB
R 567	ERDS2TJ333	C 33Kohm, J, 1/4W
R 568	ERJ8GEYJ223	C 22Kohm, J, 1/8W
R 569	ERJ8GEYJ272	C 2.7Kohm, J, 1/8W
R 570	ERDS1TJ562	C 5.6Kohm, J, 1/2W
R 571	ERJ8GEYJ152	C 1.5Kohm, J, 1/8W
R 572	ERQ12HJ100P	F 10ohm, J, 1/2W
R 573	ERDS2TJ472	C 4.7Kohm, J, 1/4W
R 574	ERDS2TJ102	C 1Kohm, J, 1/4W
R 576	ERDS2TJ822	C 8.2Kohm, J, 1/4W
R 577	ERDS2TJ103	C 10Kohm, J, 1/4W
R 578	ERDS2TJ102	C 1Kohm, J, 1/4W
R 579	ERJ8GEYJ223	C 22Kohm, J, 1/8W
R 580	ERDS2TJ223	C 22Kohm, J, 1/4W
R 581	ERDS2TJ563	C 56Kohm, J, 1/4W
R 601	ERJ8GEYJ561	C 560ohm, J, 1/8W
R 602	ERJ8GEYJ331	C 330ohm, J, 1/8W
R 603	ERJ8GEYJ152	C 1.5Kohm, J, 1/8W
R 604	ERDS2TJ561	C 560ohm, J, 1/4W
R 605	ERJ8GEYJ224	C 220Kohm, J, 1/8W
R 606	ERDS2TJ104	C 100Kohm, J, 1/4W
R 607	EVND2AA03B14	APC 10KohmB
R 608	ERDS2TJ152	C 1.5Kohm, J, 1/4W

No.	Part No.	Description
R 609	ERDS2TJ332	C 3.3Kohm, J, 1/4W
R 610	ERDS2TJ153	C 15Kohm, J, 1/4W
R 611	EVUE20E25B14	Tint 10KohmB
R 612	ERJ8GEYJ273	C 27Kohm, J, 1/8W
R 613	EVUE20E25B14	Color 10KohmB
R 614	ERDS2TJ101	C 100ohm, J, 1/4W
R 615	ERDS2TJ101	C 100ohm, J, 1/4W
R 616	ERJ8GEYJ225	C 2.2Mohm, J, 1/8W
R 617	ERDS2TJ474	C 470Kohm, J, 1/4W
R 618	ERDS2TJ473	C 47Kohm, J, 1/4W
R 620	ERDS2TJ473	C 47Kohm, J, 1/4W
R 622	ERJ8GEYJ332	C 3.3Kohm, J, 1/8W
R 623	ERDS2TJ103	C 10Kohm, J, 1/4W
R 624	ERJ8GEYJ563	C 56Kohm, J, 1/8W
R 650	ERJ8GEYJ822	C 8.2Kohm, J, 1/8W
R 651	ERJ8GEYJ393	C 39Kohm, J, 1/8W
R 652	ERJ8GEYJ102	C 1Kohm, J, 1/8W
R 653	ERJ8GEYJ101	C 100ohm, J, 1/8W
R 654	ERDS2TJ822	C 8.2Kohm, J, 1/4W
R 655	ERDS2TJ393	C 39Kohm, J, 1/4W
R 801	ERF3AK2R7	W 2.7ohm, K, 3W
R 803	ERG1ANJ683H	M 68Kohm, J, 1W
R 804	EROS2CKF1431	M 1.43Kohm, F, 1/4W
R 805	EROS2CKF2001	M 2.00Kohm, F, 1/4W
R 806	ERDS2TJ331	C 330ohm, J, 1/4W
R 807	EVND8AA00B14	B+ Adj. 10KohmB
R 808	EROS2CKF2261	M 2.26Kohm, F, 1/4W
R 809	ERG1SJ331P	M 330ohm, J, 1W
R 810	ERG1SJ221P	M 220ohm, J, 1W
R 812	ERG1SJ271P	M 270ohm, J, 1W
R 813	ERG2ANJ330H	M 33ohm, J, 2W
R 814	ERX1ANJPR47S	M 0.47ohm, J, 1W
R 815	ERDS2TJ102	C 1Kohm, J, 1/4W
R 816	ERDS2TJ102	C 1Kohm, J, 1/4W
R 818	ERQ12HJ1R0P	F 1ohm, J, 1/2W
R 819	ERDS1TJ152	C 1.5Kohm, J, 1/2W
R 821	ERDS1TJ563	C 56Kohm, J, 1/2W
R 822	ERQ14AJ2R2P	F 2.2ohm, J, 1/4W
R 823	ERJ8GEYJ562	C 5.6Kohm, J, 1/8W

CAPACITORS

C 308	ECUX1H180JCM	C 18pF, J, 50V
C 311	ECEA1CU100	E 10uF, 16V
C 312	ECUX1H121KCM	C 120pF, K, 50V
C 314	ECEA1CU100	E 10uF, 16V
C 315	ECEA1EU4R7	E 4.7uF, 25V
C 316	ECEA1CU100	E 10uF, 16V
C 317	ECEA1CU220	E 22uF, 16V
C 318	ECEA1CU100	E 10uF, 16V
C 320	ECEA1CU102	E 1000uF, 16V
C 371	ECEA1CU220	E 22uF, 16V
C 372	ECUX1H103ZFM	C 0.01uF, Z, 50V
C 373	ECUX1H103ZFM	C 0.01uF, Z, 50V

No.	Part No.	Description
C 374	ECUX1H333KBH	C 0.033uF, K, 50V
C 375	ECEA2CU4R7	E 4.7uF, 160V
C 378	ECUX1H333KBH	C 0.033uF, K, 50V
C 381	ECUX1H391KBM	C 390pF, K, 50V
C 382	ECUX1H391KBM	C 390pF, K, 50V
C 383	ECUX1H391KBM	C 390pF, K, 50V
C 401	ECEA1CU221	E 220uF, 16V
C 402	ECUX1H103ZFM	C 0.01uF, Z, 50V
C 403	ECQM1H273KV	P 0.027uF, K, 50V
C 404	ECSF1CE225	T 2.2uF, 16V
C 405	ECSF1CE335	T 3.3uF, 16V
C 406	ECUX1H472KBM	C 4700pF, K, 50V
C 407	ECEA1EU100	E 10uF, 25V
C 408	ECEA1HU4R7	E 4.7uF, 50V
C 410	ECEA1CU102	E 1000uF, 16V
C 411	ECUX1H472KBM	C 4700pF, K, 50V
C 412	ECEA1VU101	E 100uF, 35V
C 413	ECQM1472KZ	P 4700pF, K, 100V
C 417	ECQM1H104KV	P 0.1uF, K, 50V
C 418	ECKF1H102KB	C 1000pF, K, 50V
C 419	ECQM1H153KV	P 0.015uF, K, 50V
C 420	ECEA1HU010	E 1uF, 50V
C 421	ECEA50Z1B	E 1uF, 50V
C 422	ECUX1H153KBM	C 0.015uF, K, 50V
C 423	ECKF1H103ZF	C 0.01uF, Z, 50V
C 424	ECUX1H473ZFM	C 0.047uF, Z, 50V
C 503	ECEA1HU2R2	E 2.2uF, 50V
C 505	ECUX1H561KBM	C 560pF, K, 50V
C 506	ECQM1H153KV	P 0.015uF, K, 50V
C 507	ECQM1H473KV	P 0.047uF, K, 50V
C 508	ECQM1H223KV	P 0.022uF, K, 50V
C 509	ECEA1HU2R2	E 2.2uF, 50V
C 510	ECQK1682JZ	P 6800pF, J, 100V
C 511	ECEA1CU101	E 100uF, 16V
C 512	ECKD2H101KB2	C 100pF, K, 500V
C 513	ECKD3D102JBN	C 1000pF, J, 2KV
C 514	ECKD3D102JBN	C 1000pF, J, 2KV
C 515	ECKD3D152JBN	C 1500pF, J, 2KV
C 519	ECQM4822JZ	P 8200pF, J, 400V
C 520	ECQF2H184JZ	PP 0.18uF, J, 200V
C 521	ECEA2EU3R3	E 3.3uF, 250V
C 522	ECEA2CU101	E 100uF, 160V
C 523	ECEA1EU221	E 220uF, 25V
C 524	ECEA1VU331	E 330uF, 35V
C 525	ECEA1EU100	E 10uF, 25V
C 526	ECEA1HU330	E 33uF, 50V
C 528	ECEA1HU2R2	E 2.2uF, 50V
C 529	ECUX1H391KBM	C 390pF, K, 50V
C 530	ECUX1H221KBM	C 220pF, K, 50V
C 531	ECCF1H560J5	C 56pF, J, 50V
C 532	ECQP1H472JZ	PP 4700pF, J, 50V
C 533	ECUX1H221KBM	C 220pF, K, 50V
C 534	ECEA35W4R7Q	E 4.7uF, 35V
C 535	ECUX1H151KCM	C 150pF, K, 50V

No.	Part No.	Description
C 536	ECUX1H391KBM	C 390pF, K, 50V
C 537	ECEA1CU470	E 47uF, 16V
C 538	ECKF1H331KB	C 330pF, K, 50V
C 539	ECUX1H331KBM	C 330pF, K, 50V
C 551	ECEA1AU471	E 470uF, 10V
C 552	ECEA0JU220	E 22uF, 6.3V
C 601	ECUX1H560JCM	C 56pF, J, 50V
C 602	ECUX1H104ZFM	C 0.1uF, Z, 50V
C 604	ECKF1H103ZF	C 0.01uF, Z, 50V
C 605	ECQM1H273KV	P 0.027uF, K, 50V
C 606	ECEA1HUR47	E 0.47uF, 50V
C 607	ECEA1HN4R7S	E 4.7uF, 50V
C 608	ECEA1HUR22	E 0.22uF, 50V
C 609	ECQM1H393KV	P 0.039uF, K, 50V
C 610	ECUX1H470JCM	C 47pF, J, 50V
C 611	ECUX1H050DCM	C 5pF, D, 50V
C 612	ECEA1HU2R2	E 2.2uF, 50V
C 614	ECUX1H152KBM	C 1500pF, K, 50V
C 615	ECEA1HU010	E 1uF, 50V
C 650	ECEA1CU100	E 10uF, 16V
C 651	ECEA1CU100	E 10uF, 16V
C 652	ECEA1CU100	E 10uF, 16V
C 653	ECEA1CU100	E 10uF, 16V
C 801	ECQU1A333MH	P 0.033uF, M, 125VAC
C 802	ECQU1A333MH	P 0.033uF, M, 125VAC
C 803	ECKDNS472ME	C 4700pF, 125VAC
C 805	ECKD2H103PU7	C 0.01uF, P, 500V
C 806	ECKD2H103PU7	C 0.01uF, P, 500V
C 807	ECKD2H103PU7	C 0.01uF, P, 500V
C 809	ECET2DR221SW	E 220uF, 200V
C 810	ECQM1H104KV	P 0.1uF, K, 50V
C 811	ECEA1HU470	E 47uF, 50V
C 812	ECEA1HU4R7	E 4.7uF, 50V
C 813	ECKF1H221KB	C 220pF, K, 50V
C 814	ECKDNS221MB	C 220pF, 125VAC
C 815	ECKDNS221MB	C 220pF, 125VAC
C 816	ECKF1H103ZF	C 0.01uF, Z, 50V
C 819	ECEA2CU221W	E 220uF, 160V
C 820	ECEA1EU222	E 220uF, 25V
C 821	ECKD3D102KBN	C 1000pF, K, 2KV
DIODES		
D 310	MA165	Diode
D 314	MA165	Diode
D 315	MA165	Diode
D 401	TVSRD15EB1	Zener Diode Vz=15V
D 402	MA165	Diode
D 403	TVSEM-1Z	Diode
D 404	MA165	Diode
D 405	TVSRD24EB1	Zener Diode Vz=24V
D 406	MA27T-A	Diode
D 407	MA165	Diode
D 408	MA165	Diode

No.	Part No.	Description
D 409	MA165	Diode
D 501	MA165	Diode
D 503	ES01F	Diode
D 504	TVSRGP10J	Diode
D 505	MA167	Diode
D 506	AU01Z	Diode
D 507	TVSES-1	Diode
D 508	TVSRGP10J	Diode
D 509	MA165	Diode
D 510	TVSRGP10J	Diode
D 511	MA27W-A	Diode
D 512	TVSRD12EBM	Zener Diode Vz=12V
D 514	MA165	Diode
D 515	MA165	Diode
D 516	MA165	Diode
D 517	MA165	Diode
D 518	MA165	Diode
D 520	MA27W-A	Diode
D 524	MA165	Diode
D 551	MA165	Diode
D 552	TVSRD9.1ESB2	Zener Diode Vz=9.1V
D 553	MA165	Diode
D 554	TVSRD5.1ESB2	Zener Diode Vz=5.1V
D 601	MA165	Diode
D 602	MA165	Diode
D 801	EM2B	Diode
D 802	EM2B	Diode
D 803	EM2B	Diode
D 804	EM2B	Diode
D 805	MA171	Diode
D 806	MA1068-L	Zener Diode Vz=6.8V
D 808	TVSES-1Z	Diode
D 809	1N4003	Diode
D 810	TVSRGP10J	Diode
D 811	ERB44-08	Diode
D 812	TVSRGP10J	Diode
D 813	R2KN-1	Diode
D 814	ERPZ4B0M100B	Posistor
D 816	TVSRGP10J	Diode
D 817	P6KE130A	Diode
INTEGRATED CIRCUITS		
IC 401	AN5436N	Deflection Signal Process
IC 402	AN5515X	V. Deflection Output
IC 501	TVSUPD4503BC	3 State Driver
IC 502	L78M12	+12V Regulator
IC 601	AN5316N	Video/Chroma Signal Process
COILS		
L 304	TLK817	Delay Line
L 306	TLT470K266	Peaking Coil
L 371	EFDMA645B95G	Delay Line (1H)
L 372	TLK153152	Peaking Coil
L 502	ELH5L424	Linearity Coil
L 504	TLUABTA151K	Peaking Coil

No.	Part No.	Description
L 505	TLT100K991R	Peaking Coil
L 506	TLTAMS1103K	Peaking Coil
L 507	TLPI3113E	Choke Coil
L 601	TLUABTA150K	Peaking Coil
L 603	TLT222K993G	Peaking Coil
L 801	ELF18D216	Line Filter
L 803	TSC928-4	Ferrite Choke
TRANSISTORS		
Q 308	2SA933S	Video Buffer
Q 371	2SC1740S	Video Buffer
Q 372	2SC1740S	Differential Amp.
Q 373	2SC1740S	Differential Amp.
Q 374	2SC1740S	Chroma Buffer
Q 375	2SC1740S	Video Buffer
Q 380	2SC1740S	Comb Switch
Q 401	2SC1383-NC	V. Position
Q 402	2SA933S	V. Sync Delay
Q 403	2SC1740S	V. Sync Delay
Q 501	2SC1473AH	H. Drive
Q 502	2SD1439-Q	H. Output
Q 504	2SC1740S	X-Ray Protector
Q 505	2SC1740S	Sync Separator
Q 506	2SC1740S	Sync Inverter
Q 507	2SC1740S	Sync Buffer
Q 508	2SB774-R	Sync Differential
Q 509	2SA933S	H. Sync Delay
Q 510	2SD889-R	H. Sync Delay
Q 511	2SA933S	H. Sync Inverter
Q 512	2SA933S	H. Size/Under Scan
Q 513	2SD1266	H. Size/Under Scan
Q 514	2SC1740S	Burst Color Killer
Q 515	2SD889-R	Sync Buffer
Q 551	2SA933S	Current Protector
Q 602	2SA933S	Burst Color Killer
Q 603	2SA933S	Burst Color Killer
Q 610	2SC1740S	Chroma Amp.
Q 611	2SC1740S	Chroma Amp.
Q 801	2SC3872-LS	Power Switching Output
Q 802	2SA885-R	Drive/Q801
Q 803	2SD965-R	Current Protector
Q 804	2SC1740S	Error Detector
TRANSFORMERS		
T 501	PALF34709F	FBT
T 502	TLH15412	H. Drive Trans.
T 801	ETS35K403A	Power Switching Trans.
OTHERS		
X 601	TSS816N2	Crystal Osc.
SW 302	ESB621282	Function Switch
SW 401	EVQR4AL13	Service Switch
F 801	XBA1F30NU100	Fuse 125V/3A
A17	PAXAJE04901Y	1P GND Lead

No.	Part No.	Description
A18-A21	PAXAJT08901Y	4P Coupler/CO-4L
A22-A23	PAXAJT06901Y	2P Coupler/CO-3L
A24-A29	PAXAJT09901Y	6P Coupler/CO-5L
CO-5A	TJS168960	2P Connector
A-1	TMM13497	Clamper
A-2	TMM13497	Clamper
A-3	TMM15412-1	Clamper
	XTV3+8B	Screw/FBT
	XNG3BS	Nut/IC402
	XYN3+C8	Screw/IC402
	TUC27735-1	Heat Sink/IC402
	NO18K	Mica Sheet/Q502
	TUC37746	Heat Sink/Q502
	XNG3BS	Nut/Q502
	XSN3+10S	Screw/Q502
	XWA3B	Washer/Q502
	XWG3	Washer/Q502
	PAUC35601	Heat Sink/Q801
	XWG3	Washer/Q801
	XYN3+C10	Screw/Q801
	TJS5A9310	4P Cable Holder
	TJS5A9330	6P Cable Holder

Neck Board (C-Board)

No.	Part No.	Description
RESISTORS		
R 351	EVN61AA00B53	Cut Off Blue 5KohmB
R 352	ERDS2TJ122	C 1.2Kohm, J, 1/4W
R 353	EVN61AA00B53	Cut Off Red 5KohmB
R 354	ERDS2TJ122	C 1.2Kohm, J, 1/4W
R 355	ERDS2TJ183	C 18Kohm, J, 1/4W
R 356	EVN61AA00B13	Drive Blue 1KohmB
R 357	EVN61AA00B13	Drive Red 1KohmB
R 358	ERDS2TJ471	C 470ohm, J, 1/4W
R 359	ERDS2TJ151	C 150ohm, J, 1/4W
R 360	ERDS2TJ472	C 4.7Kohm, J, 1/4W
R 361	ERG1SJ153P	M 15Kohm, J, 1W
R 362	ERG1SJ153P	M 15Kohm, J, 1W
R 363	ERG1SJ153P	M 15Kohm, J, 1W
R 364	ERC14GK272	S 2.7Kohm, K, 1/4W
R 365	ERC14GK272	S 2.7Kohm, K, 1/4W
R 366	ERC14GK272	S 2.7Kohm, K, 1/4W
CAPACITORS		
C 351	ECKF1H331KB	C 330pF, K, 50V
C 352	ECKF1H221KB	C 220pF, K, 50V
C 353	ECKD3D681KBN	C 680pF, K, 2KV
C 358	ECKF1H221KB	C 220pF, K, 50V
TRANSISTORS		
Q 351	2SC1473-QRNC	Video Output
Q 352	2SC1473-QRNC	Video Output

No.	Part No.	Description
Q 353	2SC1473-QRNC	Video Output
OTHERS		
	TJS1A5080	CRT Socket
	TJS5A9310	4P Cable Holder
	TJS5A9330	6P Cable Holder

Terminal Board (L-Board)

No.	Part No.	Description
RESISTORS		
R 201	ERJ8GEYJ472	C 4.7Kohm, J, 1/8W
R 202	ERJ8GEYJ103	C 10Kohm, J, 1/8W
R 203	ERJ8GEYJ153	C 15Kohm, J, 1/8W
R 204	ERDS2TJ472	C 4.7Kohm, J, 1/4W
R 205	ERJ8GEYJ103	C 10Kohm, J, 1/8W
R 206	ERJ8GEYJ153	C 15Kohm, J, 1/8W
R 207	ERJ8GEYJ104	C 100Kohm, J, 1/8W
R 208	ERDS2TJ102	C 1Kohm, J, 1/4W
R 209	ERJ8GEYJ102	C 1Kohm, J, 1/8W
R 210	ERJ8GEYJ182	C 1.8Kohm, J, 1/8W
R 211	ERJ8GEYJ821	C 820ohm, J, 1/8W
R 212	ERJ8GEYJ4R7	C 4.7ohm, J, 1/8W
R 213	ERJ8GEYJ561	C 560ohm, J, 1/8W
R 214	ERJ8GEYJ822	C 8.2Kohm, J, 1/8W
R 215	ERDS2TJ272	C 2.7Kohm, J, 1/4W
R 218	ERJ8GEYJ273	C 27Kohm, J, 1/8W
R 219	ERJ8GEYJ273	C 27Kohm, J, 1/8W
R 220	ERQ12AJ100P	F 10ohm, J, 1/2W
R 222	ERDS1TJ272	C 2.7Kohm, J, 1/2W
R3001	ERJ8GEYJ101	C 100ohm, J, 1/8W
R3002	ERJ8GEYJ822	C 8.2Kohm, J, 1/8W
R3003	ERJ8GEYJ393	C 39Kohm, J, 1/8W
R3004	ERJ8GEYJ101	C 100ohm, J, 1/8W
R3005	ERJ8GEYJ822	C 8.2Kohm, J, 1/8W
R3006	ERJ8GEYJ393	C 39Kohm, J, 1/8W
R3007	ERJ8GEYJ102	C 1Kohm, J, 1/8W
R3008	ERJ8GEYJ750	C 75ohm, J, 1/8W
R3009	ERJ8GEYJ750	C 75ohm, J, 1/8W
R3010	ERJ8GEYJ750	C 75ohm, J, 1/8W
R3011	ERJ8GEYJ562	C 5.6Kohm, J, 1/8W
R3012	ERJ8GEYJ562	C 5.6Kohm, J, 1/8W
R3013	ERDS2TJ471	C 470ohm, J, 1/4W
R3014	ERJ8GEYJ821	C 820ohm, J, 1/8W
R3015	ERJ8GEYJ224	C 220Kohm, J, 1/8W
R3016	ERJ8GEYJ272	C 2.7Kohm, J, 1/8W
R3017	ERJ8GEYJ271	C 270ohm, J, 1/8W
R3018	ERJ8GEYJ471	C 470ohm, J, 1/8W
R3019	ERJ8GEYJ750	C 75ohm, J, 1/8W
R3020	ERJ8GEYJ101	C 100ohm, J, 1/8W
R3021	ERJ8GEYJ822	C 8.2Kohm, J, 1/8W

No.	Part No.	Description
R3022	ERJ8GEYJ393	C 39Kohm, J, 1/8W
R3023	ERJ8GEYJ102	C 1Kohm, J, 1/8W
R3024	ERJ8GEYJ101	C 100ohm, J, 1/8W
R3025	ERJ8GEYJ822	C 8.2Kohm, J, 1/8W
R3026	ERJ8GEYJ393	C 39Kohm, J, 1/8W
R3027	ERJ8GEYJ750	C 75ohm, J, 1/8W
R3028	ERJ8GEYJ101	C 100ohm, J, 1/8W
R3029	ERJ8GEYJ392	C 3.9Kohm, J, 1/8W
R3030	ERJ8GEYJ564	C 560Kohm, J, 1/8W
R3031	ERJ8GEYJ102	C 1Kohm, J, 1/8W
R3032	ERJ8GEYJ331	C 330ohm, J, 1/8W

CAPACITORS

C 201	ECEA1HU010	E 1uF, 50V
C 202	ECEA1HU010	E 1uF, 50V
C 203	ECEA1CU100	E 10uF, 16V
C 204	ECEA1EU4R7	E 4.7uF, 25V
C 206	ECEA1CU100	E 10uF, 16V
C 207	ECUX1H103ZFM	C 0.01uF, Z, 50V
C 208	ECEA1HU2R2	E 2.2uF, 50V
C 209	ECUX1H104ZFM	C 0.1uF, Z, 50V
C 210	ECEA1EU221	E 220uF, 25V
C 211	ECEA1EU221	E 220uF, 25V
C 212	ECEA1CU221	E 220uF, 16V
C 213	ECUX1H103ZFM	C 0.01uF, Z, 50V
C 214	ECEA1CU100	E 10uF, 16V
C 215	ECEA1CU100	E 10uF, 16V
C 216	ECEA1CU221	E 220uF, 16V
C3001	ECEA1CU100	E 10uF, 16V
C3002	ECEA1CU100	E 10uF, 16V
C3003	ECEA1CU100	E 10uF, 16V
C3004	ECEA1CU100	E 10uF, 16V
C3005	ECUX1H683ZFH	C 0.068uF, Z, 50V
C3006	ECUX1H683ZFH	C 0.068uF, Z, 50V
C3007	ECUX1H470JCM	C 47pF, J, 50V
C3008	ECEA1CU470	E 47uF, 16V
C3010	ECEA1CU100	E 10uF, 16V
C3011	ECEA1CU100	E 10uF, 16V
C3012	ECEA1CU100	E 10uF, 16V
C3013	ECEA1CU100	E 10uF, 16V
C3014	ECEA1CU100	E 10uF, 16V
C3015	ECUX1H221JCM	C 220pF, J, 50V

DIODES

D3001	MA4056-M	Zener Diode Vz=5.6V
D3002	MA165	Diode
D3003	MA4056-M	Zener Diode Vz=5.6V
D3004	MA165	Diode
D3005	MA4056-M	Zener Diode Vz=5.6V
D3006	MA165	Diode
D3007	MA27T-B	Diode
D3008	MA4056-M	Zener Diode Vz=5.6V
D3009	MA165	Diode
D3010	MA165	Diode
D3011	MA4056-M	Zener Diode Vz=5.6V
D3012	MA165	Diode

No.	Part No.	Description
INTEGRATED CIRCUITS		
IC 201	AN5265	Audio Output
TRANSISTORS		
Q 201	2SC1740S	Audio Buffer
Q 202	2SC1740S	Audio Buffer
Q3001	2SC1740S	Video Buffer
Q3002	2SC1740S	Video Buffer
Q3003	2SC1740S	Video Buffer
Q3004	2SA933S	Video Amp & Clamp
Q3005	2SA933S	Video Buffer
Q3007	2SC1740S	Video Buffer
Q3008	2SC1740S	Video Amp & Clamp
Q3009	2SA933S	Ext. Sync Buffer
OTHERS		
SW3001	ESD32154	75Ω/HI-Z Change
SW3002	ESD32154	Video/S-Video Change
L13	PAXAJE03901Y	1P GND Lead
CO-1L	TJS169070	3P L-Type Connector
CO-2L	TJS169071	3P L-Type Connector
CO-3L	TJS169060	2P Connector
CO-4L	TJS168980	4P Connector
CO-5L	TJS169010	6P Connector
L-1	TMM5439	Clamper
	PAMM35405	2P Cable Holder
	TJS5A9310	4P Cable Holder
	TJS5A9330	6P Cable Holder

LED Board (C-Board)

No.	Part No.	Description
DIODES		
D 815	LN38GP	LED
OTHERS		
	KL-02	LED Spacer
D1-D2	PAXAJT07901Y	2P Coupler/CO-5A

Packing Parts

No.	Part No.	Description
PACKING		
P 1	PAPC3511001	Packing Case
P 2	PAPD351009	Cushion(Top Front)
P 3	PAPD351010	Cushion(Top Rear)
P 4	PAPD352009	Cushion(Bottom Front)
P 5	PAPD352010	Cushion(Bottom Rear)
P 6	PAQB310026	Operating Instructions
P 7	TQB817002-1	Safety Instructions
P 8	TQD67180631A	Warranty Card
P 9	VQA0053	Service Center List
P 10	TQE616	Cover for O/I
P 11	TPE114115	Cover for Unit

